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# AN ADVAITIN'S PLEA FOR CONTINUITY[1]

By

S. S. SURYANARAYANA SASTRI.

The charge that our philosophy has been divorced from our lives has been so often repeated that it has become common-place. We are content with repeating it where we do not ignore it. And with the sublimest of our philosophies, the advaita, firmly established by Kerala's greatest son, we seem compelled to admit the substance of the charge and claim that it is no defect at all, that it is a bhūṣaṇa, not a dūṣaṇa. For, has not philosophy for its sphere the highest reality—the paramārtha, while all mundane pursuits are concerned only with the empirically real, the vyāvahārika? Nothing can be gained surely by mixing up the two except confusion, unrighteousness and despair. The concerns of the world are best regulated by sciences—physical, biological, social, and the laws they have codified. The march of time may necessitate some changes in these codes; but there can and will never be such a radical change as will convert any of the sciences into philosophy. The sciences in the narrow sense are pāñcabhautika; even where the term refers to the moral sciences, we are still concerned with Dharma not Brahman; between the one which is ever-attained perfection and the other which is a quest of to-be-attained perfection no comparison should be possible. It may be that the pursuit of science or dharma leads one eventually to the eternal truth. But to mix up the two pursuits mistaking the one for the other will lead to wandering endlessly in the deserts of error. So long as you are in and of the world, observe its standards, obey its laws; seek not to transgress them in the confused light of a spiritual unity. That unity is no doubt real, but it is not for you and me, just because we still think of ourselves in the plural. Laws and codes may be surmounted when plurality is transcended, not a moment earlier.

1. Substance of an address delivered as President of the Section of Philosophy and Religion at the All-India Oriental Conference, Trivandrum, 1937.

The consequences of such doctrine cannot but be far reaching in the realms both of theory and practice. The upholder of philosophic unity has no right to sacrifice multiplicity; but surely he has no right to hypostatise the discrete and the diverse as the pluralist does. He cannot hold (as does a modern exponent of advaita)[2] that in the realm of vyavahāra he grants *as much* reality to the multiverse as does the dvaitin. There are not two realms, those of vyavahāra and paramārtha; there is only one reality—the pāramārthika, of which the vyāvahārika is a section and a semblance. And while in the section there cannot *ex hypothesi* be presented a synoptic view of the whole, yet the whole cannot but be in the part too, informing it, while sustaining it. From the empirical to the real, from appearance to the absolute, a passage is either possible or it is not. If not, the absolutist philosophy is an irrelevant nightmare. If on the contrary the passage is possible, there can be no radical discontinuity between the two. The appearance is neither entirely an appearance nor has it a distinctive reality in a fantastic realm of its own. It is real; but its reality derives from and is reducible to the Absolute. Non-dualism (or Illusionism if that name be preferred) may be appreciated by the few; but it is *not inapplicable* to the many. It may repel them, as indeed which increase in knowledge or invention did not. Neither the Copernican theory nor the steam-engine was welcomed with open arms even by the enlightened among the populace.

It is only on such lines that the doctrine of adhikāri-bheda is to be understood. It is not that the non-adhikārin *should* not take to the quest of the self but that he will not normally; even if he does, he cannot pursue it successfully; and a wilful pursuit in these circumstances will lead to repeated failures and perhaps considerable loss to the community in respect of the services he could have usefully rendered; only thus can there be justification for social or legal condemnation of such inquiry, not on the ground of eternal damnation for the inquirer; for, the advaitin cannot hold to the doctrine of the damnation of any one. Realisation is possible for all and inevitable for all; some realise earlier, others later; not all methods are suitable to all; the closing of certain paths is purportful only as indicating others which will be more serviceable in the case of particular adhikārins. Hence it is that Śaṅkara denied to the śūdra the eligibility for Vedānta study alone, not for Brahman-knowledge. His successors, however, were far less liberal. Over-

2. Mm. N. S. Anantakṛṣṇa Śāstrin, in the Sanskrit Introduction to his new edition of *Nyāyāmṛta-Advaitasiddhi*.

powered by the weight of traditions, codes and prejudices, the only salvation they could see even for the enlightened non-dvija was through re-birth as a dvija ;[3] and even among dvijas, the brahmin had pride of place; for he alone could renounce, and renunciation is an indispensable preliminary even to Vedānta-śravaṇa ; so the hapless śūdra who obtained rebirth as a kṣatriya or a vaiśya had to spend yet another life in probation. Such a stair-case theory of spiritual progression could commend itself to these self-appointed private secretaries of Providence, only because the all-pervasive Absolute was confounded with a spiritual pontiff and immured in a *sanctum sanctorum* outside which all inequalities and iniquities could be perpetrated and perpetuated. If it is true that the spirit is eternally pure, wise and free, surely it must be permissible to look for purity even in defilement, wisdom in ignorance, freedom in bondage. And does it not savour of audacity for us frail and ignorant mortals to say that thus and thus alone can the infinite spirit realise itself, not in any other, or that such and such births and rituals are indispensable before wisdom can dawn ? Prescribed paths and modes are alright in their place ; they serve to guide, but not to dominate ; outside them there may be little safety, but there is no damnation. The Gītācārya was surely right when he said that paradharma imports fear ; but fear produces flight only in the timid. Indian mariners of olden times, we are told, were not content with coastal navigation; they fared forth in uncharted seas and were attended with notable success. Why should we in the sea of the spirit alone cling fast to buoys and mooring ropes, fearing to venture forth ? Have we not less cause for fear than the mariner? The waste of waters is but his element, whereas the ocean of spirit is not an alien entity but our own very self.

Realisation is not the monopoly of any class nor of any mode. It may come through spiritual analysis or through the melting of the heart in devotion or through self-surrender in service. This is not an innovation due to Western impact. Bhāratītīrtha in the 14th century indicated the possibility of realisation through meditation on the nirguṇa, instead of Vedānta-inquiry ;[4] such contemplation he identified with yoga and cited in his support the *Gītā* verse :

" yat sāṅkhyaiḥ prāpyate sthānam tad yogair api gamyate."

3. See the *Siddhāntaleśasaṅgraha,* Chapter III, sections 1. 422 and 2. 142 (Madras University edition).

4. See the *Siddhāntaleśasaṅgraha,* Chapter III, section 3.0.

The difference between the two paths was only of the time taken. This idea of greater or less delay, again, is as old at least as Maṇḍana Miśra, who held that āśrama-karmas like agnihotra were helpful to the seeker as a horse is to the wayfarer in reaching the goal quicker. Of a piece with Bhāratītīrtha's teaching is Madhusūdana's doctrine of bhakti as a mode of realisation. In the case of Madhusūdana, however, the intellectualist *virus* has been active; we are not merely told that what is realised through bhakti is the conditioned (this may be paralleled by what Vācaspati has to say of sākṣātkāra), but we seem to be aware all the time of a struggle between intellectual loyalty to the unconditioned and emotional loyalty to the conditioned. And all this because of an ancient prejudice against the emotions and the will. The melting of the heart in love is not less noble than the expansion of it in wisdom; and the transcendence of the gulf between kartṛ and karma in action is not less noteworthy than the transcendence of that between seer and seen in knowledge. The unity appears in and breaks through the multiplicity every moment in emotion and volition no less than in intellection. One of these is not more sacrosant than the others. And the philosophy of nondualism should look for integrative synthesis rather than intellectual dominance. Bhakti and karma-yoga have found recognition among our teachers; but they have seldom been treated by the advaitin as on a par with intellectual inquiry. Realisation is not the prerogative of the intellect; the most that intellect can claim is that in some cases it is a quicker guide.

The contrast normally developed between jñāna and karma is largely responsible for the exaltation of the former. Knowledge is of what is; it is necessary and certain; action relates to what is to be; it is uncertain and arbitrary. But cognition, which depends not merely on capacity but also interests, is not less uncertain than conation. If facts compel, so do purposes and character. And if the cognitive functioning makes us aware even of the unpleasant and unwilled, so does conation bring about the unpleasant and the not directly willed. The drain-inspector cannot avoid the stink of the sewer; no more can the revolutionary avoid killing scores of his beloved comrades in wrecking a royal train. Is there any reason why the former should be nearer Brahman-realisation than the latter?

In a world that deified ritual while abolishing the deity Śaṅkara found himself compelled to wage unceasing war against the Mīmāṃsaka. This pre-occupation led to a two-fold defect, an exaggeration of the role of cognition and a depreciation of unity in the empirical world. The adoption of the Bhāṭṭa-naya in vyavahāra

has not been an unmixed blessing to the advaitin. The insistence on empirical plurality can be overdone to the extent of making non-dualism appear otiose. Thus, the sphoṭa-vādin maintains the reality of a single artha-prasava-nimitta, called sphoṭa, gradually and increasingly manifested in successive sounds constituting a word; and the manifestation of this unity as a multiplicity he illustrates with the analogy of the reflection of a single face in different media. Though this analogy is acceptable to and handled by the advaitin in other contexts, the doctrine of sphoṭa has been discarded for no compelling reason by successive advaitins from Śaṅkara downwards. In this matter, as also in viewing emotions as to be sublimated and not suppressed, Maṇḍana is perhaps a truer advaitin. Sphoṭa-vāda, he holds, is an auxilliary to advaita; and the Brahman that he establishes is the Bliss wherein desires are quelled by being sublimated from the fleeting to the permanent, not extirpated, since extirpation is impossible. It may be legitimately claimed that Maṇḍana is foremost among integrative advaitins,[5] for whom unity instead of residing in a transcendent sphere informs and enlivens all aspects of this empirical multiverse. At no time or stage and in no mode of life is this unity to be shelved or forgotten. It is not a garment to be doffed nor a tool to be put aside or reclaimed. Nor is it a unity which is somehow lumped with the multiplicity as is done by the philosophers of identity-in-difference.[6]

It is Maṇḍana again who held avidyā and vidyā to co-exist, the former being a preparation for and an instrument to

5. A very plausible reason for Maṇḍana's success in this line is his combination of advaita with the householder's āśrama. The popular story of his defeat in argument by Śaṅkara and his subsequent renunciation seem to have little warrant in fact. The Maṇḍana-Sureśvara equation can gain little credence after the elaborate examination of it in recent years (see particularly Mm. S. Kuppuswami Sastri's Introduction to the *Brahmasiddhi*; the writer of the Foreword to that book holds a different view, but he has done little to substantiate it or go into the merits of the learned editor's arguments).

6. The identity is more fundamental than the difference; it accounts for the difference and is present in the difference; but the difference is non-real; nor is it that they are real in different spheres or at different times. As Bhagavān Ramaṇa says:

*சாதகத்திலே துவிதம் சாத்தியத்தி லத்துவிதம்*
*ஓதுகின்ற வாதமது முண்மையல—ஆதரவாய்த்*
*தான்தேடுங் காலும் தனையறிந்த காலத்தும்*
*தான்தசமன் றி யார்தான்.*

—*உள்ளது நாற்பது*, v. 37.

the latter. Without nescience there cannot be the dawn of knowledge. In the words of an Indian philosopher of to-day "Reality and existence are not to be set against each other as metaphysical contraries."[7] Or to cite Ramaṇa again, imperfect knowledge leads to perfect knowledge, and the latter itself is perfection, not that which has perfection for an attribute.[8]

The adoption of Bhāṭṭa-naya in the realm of practice has led to some very unsatisfactory results. Kumārila is in more than one way comparable to Hegel. The godless autonomy of Dharma has a close analogue in the super-moral autonomy of the State. And both these philosophers it will be remembered were staunch champions of identity-in-difference. A consequence of the former doctrine is our clinging to a Sanātana Dharma, in spite of advaita professions, looking for permanence in the notoriously changing world of moral observance, even while the sciences where permanance held sway still recently have turned to worship the new God of Indeterminacy. The scientist's criticism of causality is not more acute than the advaita dialectic of Śrī Harṣa and Citsukha. Yet our faith in causality, whether natural or magical, is pathetic. Is it unjust to trace this to the constitution of a separate world of vyavahāra, leaving Bhaṭṭa in undisputed sway there ?

Identity-in-difference goes with the allied doctrine of the equal primacy of negation. Every entity, says the Bhāṭṭa, combines both bhāva and abhāva aspects, positive in respect of its own existence and negative in relation to something else. True enough as far as it goes, but it does not go far enough. "Looking at a thing in relation to others," this is surely a secondary and subjective process; as such, abhāva and its expression in negation must both be secondary, not of the same grade as positivity; while positivity is constitutive of the entity, negativity can make no such claim. And difference, being anyonyābhāva, is in no better case than other forms of abhāva. What happens then to the boasted identity-in-difference? It is easy to see the evils issuing from the failure to

7. *The World's Unborn Soul*, p. 29.

8. For a pointed, if brief, statement of the doctrine of continuity, Bhagavān Ramaṇa cannot be surpassed; see vv. 17, 18 *op. cit.*, esp. the latter.

உலகுண்மை யாகு முணர்வில்லார்க் குள்ளார்க்
குலகளவா முண்மை யுணரார்க்—குலகினுக்
காதார மாயுருவற் றுருமுணர்ந்தா ருண்மை
யீதாகும் பேதமிவர்க் கெண்.

treat the negative as purely secondary. The negative, subsidiary and instrumental aspects of value obtain recognition as if possessed of independent status. The positive back-ground and starting point which alone can give them worth is forgotten. Valuations are distorted and men stray far from fruitful paths. Look to the course of ideals and events in India within the last quarter of a century; you will find a series of negations beginning with the non-brahmin movement, meandering through non-co-operation and culminating in prohibition. Nor is this only a recent phenomenon. Through centuries the grim spectre of untouchability has been stalking us. And that distinctively Indian figure, the ascetic, has appeared mostly in a negative garb; he appears as one that has nothing, not the one that has given up everything; he is not a parivrājaka except in name; for you cannot renounce what you do not have. For all our vaunted spirituality the saṃnyāsin to-day is an object of superstitious awe or tolerant contempt, not of loving devotion. Is this not due to the dominance of negation, the consequent dichotomy of the world into the "Haves" and "Have-nots" and the logically consequent contempt of the former for the latter? The 'faqir' has become a term of derision not merely in English but also in the varnacular; and for this we have the Bhāṭṭa-naya to thank. We have found the dichotomising tendency irresistible and have set up nivṛtti over against pravṛtti, inaction over against action, failing to heed the Gītācārya's warning. In this matter of negation at least the Prābhākara seems to have been nearer to the truth as envisaged in advaita. Negation for him is secondary. And not prescriptions alone but prohibitions too derive their imperative character from the realisation "mame 'dam kāryam," not "This is not to be done by me." That the advaitin should have failed to adopt and build on such a position is a phenomenon which the historian may explain, but the philosopher will continue to deplore.

It is true as Appayya says that the ancients, solely intent on establishing the unity of the self, paid no heed to what is established in empirical usage, and hence expounded manifold paths; while, however, it is wise to guide oneself by the star, it is folly to give oneself up to star-gazing. And the unkind critic may say that many are the wells into which our philosophers fell because of the latter habit. It is true that all roads lead to Rome; but some are surely shorter than others; and even the more circuitous ones may in some cases have to be preferred because of the ruggedness and neglected condition of the others. The adequate survey of paths and their proper mapping is a task which the advaitin cannot well

leave to others; for to him belong an insight and an *apercu* which cannot be theirs. In taking up this task with courage and carrying it through with perseverance the advaitin will make his contribution to render philosophy a live proposition; then will philosophy be rid of dryness and religion of superstition, and men's lives attain the roundedness of perfection, not the roundness of a cypher.

# EARTHQUAKES * †

By

M. S. Krishnan,

*Geologist, Geological Survey of India.*

Natural phenomena like volcanoes and earthquakes have excited the wonder of mankind and stricken terror into the credulous and the superstitious, aided by the fanciful explanations of the theologians and philosophers. It is barely a century since the methods of science began to be applied to the study of earthquake phenomena and careful observation and experiment took the place of speculation and theological dogma.

The great Lisbon earthquake of 1775 provoked a great deal of interest among scientists. Observations on the Chilean earthquakes in the early part of the 19th century showed that marked changes had taken place in the coastal tract of that country, and Darwin had opportunities to observe the effect of the Chilean earthquake of 1835, which he recorded in his account of the voyage of the '*Beagle*'. Lyell's *Principles of Geology*, published about the year 1830, contains references to the effects of earthquakes. Soon after these, a series of catalogues of earthquakes began to make their appearance in Europe. Von Hoff's catalogue was apparently the first to be published, about the year 1835. In 1845 David Milne published a comprehensive list of the earthquakes known to have occurred in Great Britain. Between 1848 and 1871, Alexis Perrey was responsible for issuing several parts of a catalogue intended to cover all the recorded earthquakes of the world.

Robert Mallet was one of the great pioneers of seismology and many publications issued from his pen between 1845 and 1873. The Naples earthquake of 1857 afforded him an excellent opportunity to study a seismic disturbance of the first magnitude and his

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† This formed the subject matter of two lectures delivered under the auspices of the Sir Subrahmanya Ayyar foundation of the Madras University, in October, 1937.

report thereon constitutes one of the best known early studies of seismic phenomena.

Important and useful catalogues continued to appear in later years also: by C. W. Fuchs in 1886 for the period 1865-1885; by O'Reilly in 1886; by Rudolph in 1887, 1895 and 1898. Records of particular regions were searched and lists for different countries were also made up by various seismologists: for the U.S.A., by Holden, Heck and the U.S. Weather Bureau; for Brazil by Branner; for Japan by Milne; for China by Drake, Hirota and Hoang; for India by Oldham, and so on. The most remarkable among the later catalogues is that compiled laboriously by de Montessus de Ballore and now available for consultation in manuscript form in the library of the Geographical Society of Paris where it is said to occupy 85 feet of shelf space. This great French seismologist published a large number of papers on various aspects of earthquakes and on the occurrence and distribution of earthquakes in different countries.

In 1900 the British Association for the Advancement of Science issued a catalogue of all earthquakes which had been recorded by instruments. The work of collecting and examining instrumental records of all the seismographic stations in the world is now in the hands of the International Union of Geodesy and Geophysics with its headquarters at Oxford, England. Most of the countries of the world have now organisations to investigate and collect data on earthquakes. In India, earthquake investigation may be said to have commenced in 1897, the year of the great Assam earthquake. Since then all important earthquakes have been studied in the field by officers of the Geological Survey Department but there has been no commensurate advance in theoretical studies. Seismographs have been installed in the observatories at Calcutta (Alipore), Agra, Dehra Dun, Bombay (Colaba) and Kodaikanal under the care of the Meteorological Department; there are also two stations under private agencies, *viz.*, at Ooregaum in the Kolar Gold Field and in the St. Aloysius College, Mangalore. Considering the area of the country and its seismicity, these are inadequate. There are over 40 stations in the U.S.A., and over 100 in Japan and some of the stations have several instruments. It will be necessary for India to have a much larger number of stations than at present, and equipped with suitable instruments, if any useful work is to be done to mitigate the effects of strong earthquakes. The Bihar earthquake of 1934, followed soon after by the Quetta one of 1935 has stimulated considerable interest and it is to be

hoped that early steps will be taken to establish an organisation similar to the seismological research institutes in various countries to study the problems in India.

The nature of earthquake phenomena and their effects are to be studied by a trained personnel with the help of the records made by instruments located at suitable spots and also in the field by collecting data on various aspects. Even when a large number of instruments are set up in numerous places, it will be necessary to gather field data, since some phenomena are, by their very nature, outside the scope of instrumental record. Towards this end all countries have adopted some form of questionnaire to be answered by intelligent observers in various parts of the affected area, and the one adopted in India* is given on next page. A much more elaborate and detailed questionnaire[1] is used by the U. S. Coast and Geodetic Survey which is the official agency for seismological studies in the United States of America. The collection of information is greatly facilitated by distributing copies of such questionnaire through local authorities to all people who are competent and willing to supply information. Newspapers can also materially aid the agency by publishing the questionnaire when an earthquake occurs and by throwing open its columns to correspondents who give useful information.

When the replies and other data are collected together and analysed by experts, it is possible to demarcate a central area of maximum intensity surrounded by a series of concentric zones in which the shock had successively decreasing strengths. The places which have experienced approximately the same severity of shock are located in one zone and they are separated by lines from the neighbouring zones of higher or lower intensity. Such lines are called *isoseismal lines* or *isoseists.* The central zone, in which the effects are the most intense, is called the *epicentrum,* as it lies on the surface directly over the point of origin (or *centrum*) of the shock. If the origin is very restricted and compact, the isoseists will be circular. Commonly, however, the origin is a long narrow zone giving rise to irregular isoseists which are generally roughly elliptical. Isoseists, drawn after careful investigation, give valuable information about the character of the earthquake as well as about the structure of the country.

(1) Jour. Franklin Inst. 1926, pp. 581-582.

## EARTHQUAKE REPORT.*

Place of Observation :—

(i) town or village
(ii) tahsil, taluka
(iii) district or state
(iv) nearest railway station

| | |
|---|---|
| 1. Date of earthquake (day begins and ends at midnight). | |
| 2. Time of occurrence, if possible Indian Standard Time. | |
| 3. Number of separate shocks, if more than one was felt, and intervals between. | |
| 4. Duration of shock or shocks in secs. | |
| 5. Situation of observer, whether in or out of doors, asleep or awake, sitting or standing, etc. | |
| 6. Type of building of observer's house, *i.e.*, kutcha, kutcha-pucca, pucca, one or more storeys. When was it built ? | |
| 7. Were any unusual sounds heard either before, during or after the shock and what did they resemble ? | |
| 8. What was the nature of the movement and did it appear to come from any particular direction, as ascertained from line of swing of hanging lamps, movement of liquids in cups, tubs or tanks ? | |
| 9. Was the intensity of the shock strong enough to have the following effects :— (a) To be felt by persons sitting or lying ? (b) To be felt by persons in motion? (c) To make doors, windows, etc., or loose objects rattle ? (d) To make hanging objects swing? (e) To shake trees and shrubs ? (f) To shake the observer's seat or bed ? (g) To throw down loose objects on tables and shelves, such as clocks, bottles, utensils ? (h) To crack the walls of buildings? (i) To cause greater damage ? (to be specified) (j) To cause other phenomena such as ground fissures, sand and water spouts, slipping of the banks of tanks or rivers ? | |

Observer. Superintendent of Observatory.

Date

This form should be filled up in duplicate, and one copy should be posted to each of the following addresses :—

The Director,
Geological Survey of India,
27, Chowringhee Road, Calcutta.

The Director-General
of Observatories,
Ganeshkhind Road, Poona 5.

The intensity of the felt earthquake can be computed from instrumental records or can be roughly estimated by the nature of the damage suffered over the epicentral region. It depends mainly on the horizontal acceleration and amplitude of the vibrations. The seismological research laboratory at Pasadena, California, has advocated the measurement of amplitudes on torsion seismometers having definite constants, located at about 100 km. distance from the epicentre. The scale recommended by the Institute is based on precise measurements and is therefore of a higher order of accuracy than most other scales in use.

A large number of scales of intensity have been proposed and adopted to a limited extent. One of these, due to de Rossi and Forel, is very popular but has been found to be inadequate under modern conditions; because the different grades under this are unevenly spaced. Another scale, due to Mercalli, has also been widely used and has been officially adopted by the Italian Seismological Institute. To make the Mercalli scale more useful, Sieberg combined it with Cancani's dynamical scale based on accelerations. The Sieberg scale has been somewhat condensed and modified by H. O. Wood and F. Neumann (Bull. Seism. Soc. Amer., *21*, 277-283, 1931), as given below:—

## MERCALLI SCALE

(Modified and abridged by Wood and Neumann.)

I. Not felt except under very favourable circumstances. (0—2·5 mm/sec.$^2$).

II. Felt only by a few persons at rest, especially on upper floors. Delicately suspended objects may swing. (2·5—5).

III. Felt quite noticeably indoors, especially on upper floors. Standing motor cars may rock slightly. Vibration like passing of a truck. Duration may be estimated. (5—10).

IV. During the day felt by many indoors, outdoors by few. Dishes, windows and doors disturbed, walls make cracking sound. Standing motor cars rocked noticeably. (10—25).

V. Felt by nearly everyone and many awakened. Some dishes, windows, etc., broken; a few instances of cracked plaster; unstable objects overturned. Disturbance of trees, poles and other tall objects sometimes noticed. Pendulum clocks may be effected. (25—50).

VI. Felt by all. Some heavy furniture moved; a few instances of fallen plaster or damaged chimneys; damage slight. (50—100).

VII. Damage negligible in buildings of good design and construction; slight to moderate in well built ordinary structures; considerable in poorly built ones; some chimneys broken. Noticed by persons driving motor cars. (100—250).

VIII. Damage slight in specially designed structures; considerable in ordinary substantial buildings with partial collapse; great in poor structures. Panel walls thrown out of frame structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned. Sand and mud ejected in small amounts. Changes in well water. Persons driving cars disturbed. (250—500).

IX. Damage considerable in specially designed structures; well designed frame structures thrown out of plumb; great damage in substantial buildings with partial collapse. Buildings shifted off foundations. Ground cracked conspicuously. Underground pipes broken. (500—1000).

X. Some well built wooden structures destroyed; most masonry structures and frame structures destroyed with foundations; ground badly cracked. Rails bent. Landslides considerable from river banks and steep slopes. Sand and mud shifted on ground. Water splashed over banks. (1000—2500).

XI. Few if any masonry structures left standing. Bridges destroyed. Broad fissures in ground. Underground pipes out of service. Rails bent greatly. Earth-slumps and landslips in soft ground. (2500—5000).

XII. Damage total. Waves seen on ground surfaces. Lines of sight and levels distorted. Objects thrown up into the air. (over 5000 mm/sec.$^2$).

*Note.*—Figures in parenthesis refer to acceleration in millimetres per second per second.

*Energy of earthquakes.*—The maximum intensity of an earthquake can give an idea of the total energy released by the earthquake. The energy can be calculated from the velocity, amplitude and period of all the phases of the wave trains but these must be computed from the full records of instruments situated in the neighbourhood of the epicentre, *i.e.*, within a distance of a few degrees of arc. The total energy of the Bihar earthquake of 1934 was estimated at $7 \times 10^{22}$ ergs and that of Quetta, 1935, at $7 \times 10^{21}$ ergs by Dr. S. C. Roy. (Current Science, III, p. 599, 1935) Dr. K. R. Ramanathan is of the opinion that these values are probably based on only one component of the motion and that, if the other components are taken into account, the values would be at least $2.5 \times 10^{23}$ and $2.5 \times 10^{22}$ ergs respectively. The following table gives the computed energies of some of the well-known earthquakes in India and elsewhere.

| Place. | Date. | Energy (ergs). |
|---|---|---|
| Messina (Sicily) | 28—12—1910 | $5{\cdot}7 \times 10^{23}$ |
| Hereford (England) | 17—12—1896 | $0{\cdot}8 \times 10^{24}$ |
| San Francisco (California) | 18— 4—1906 | $1{\cdot}75 \times 10^{24}$ |
| Mino-Owari (Japan) | 28—10—1891 | $2{\cdot}2 \times 10^{24}$ |
| Assam (India) | 12— 6—1897 | $1{\cdot}1 \times 10^{25}$ |
| Charleston (S.C., U.S.A.) | 31— 8—1886 | $1{\cdot}4 \times 10^{25}$ |
| San Salvador (Central America) | 7— 9—1915 | $1{\cdot}7 \times 10^{25}$ |
| Lisbon (Portugal) | 1—11—1775 | $1{\cdot}9 \times 10^{25}$ |
| New Madrid (Missouri, U.S.A.) | 7— 2—1811 | $2{\cdot}7 \times 10^{25}$ |
| Issik-Kul (Turkestan) | 3— 1—1911 | $4{\cdot}5 \times 10^{25}$ |
| * Baluchistan | 31— 5—1935 | $2{\cdot}5 \times 10^{22}$ to $10^{23}$ |
| * Kangra (India) | 4— 4—1905 | $3{\cdot}0 \times 10^{22}$ to $10^{23}$ |
| * North Bihar (India) | 15— 1—1934 | $2{\cdot}5 \times 10^{23}$ to $10^{24}$ |

* The energies of those with an asterisk have been estimated by Dr. K. R. Ramanathan, who remarks that, owing to the paucity of data, there is an uncertainty factor of 10 as shown in the Table. The others have been taken from Sieberg,—Handbuch der Physik, Bd. IV, p. 599.

$$1 \text{ H.P.} = 7{\cdot}35 \times 10^9 \text{ ergs/sec.}$$

## Observations with Instruments

*General considerations.* When certain forces act on a mass they are designated 'stress' and their resultant effect is 'strain'. Stress acting on a rigid body tends to produce shear, the relationship between stress and shear being termed 'rigidity.' The mean of the stresses applied to a body, per unit volume, is called 'bulk modulus'. When a liquid is subject to stress, the shear produced is not a constant quantity as in solids, but is proportional to the time during which the stress is operative. In the case of liquids, the proportion of stress to shear per unit volume is designated 'viscosity'.

Both temperature and pressure affect the bulk modulus, rigidity and viscosity. When the stress differences reach a certain point, then there will be breakage or fracture. When, however, the stress difference is less than the strength of the body, both rigidity and viscosity are brought into play. In such cases the distortional stress may be regarded as being made up of two parts, one proportional to the stress difference and opposed by the rigidity and the other proportional to the rate of change of the stress which is opposed by the viscosity. Under certain conditions solids may behave as very viscous media.

By the very nature of their atomic arrangement, crystals do not possess the property of elasticity to the same extent as fine-grained aggregates or glasses, provided the material is at a temperature sufficiently below the point of softening. Under ordinary conditions, the latter will be stronger than the former. Near the softening point, viscosity comes into play and the original elasticity is lost. From these general considerations it will be seen that both solids and liquids will be able to communicate compressional stresses, whereas distortional stresses as such will be communicated through solids alone. In other words, distortional stresses are not communicated by liquids but become modified.

*Types of waves in earthquakes.*—We are generally familiar with two types of waves: one is the sound wave, like that produced in the air by an explosion, in which the wave is communicated by movement forward and backward along the direction of propagation, *i.e.*, longitudinally; the other type, similar to the light wave, comprises motion perpendicular to the direction of propagation, *i.e.*, transverse. Both these types are met with in earthquakes. The velocities of these two types are:—

$$V\,(\text{longitudinal}) = [\,(k + \tfrac{4}{3}\mu)/\varrho\,]^{1/2}$$
$$V\,(\text{transverse}) = (\mu/\varrho)^{1/2}$$

where, k = bulk modulus, $\mu$ = rigidity, and $\varrho$ = density. Hence, if both the types are produced at a point within the earth simultaneously, the longitudinal wave will arrive at the surface first, and the transverse wave later. The earlier wave is called the Primary (P) and the later wave Secondary (S).

We also meet with surface waves, similar to those produced in bodies of water. But, whereas the surface waves in liquids are chiefly controlled by gravity, those in solids are controlled by the elasticity of the material. In earthquakes there are two types of surface waves. In the first type, called the *Rayleigh waves*, the surface is displaced partly in the vertical direction and partly in the direction of propagation, the velocity of the waves being 0.92 that of the S waves. In the second type, the motion is in the horizontal direction only, and perpendicular to the direction of propagation. The latter are called *Love waves* (after A. E. H. Love), and they are possible only in non-uniform media. Their velocity depends on the wave-length and the thickness of the surface layer in which the waves are observed. We have thus four types of waves in earthquakes, two of which (P and S) are 'body waves' and two 'surface waves' (Rayleigh and Love waves).

*Seismographs.*—Seismographs are instruments which record the wave motions produced in the earth. They are essentially pendulums. In modern instruments various modifications and refinements have been incorporated.

Ordinary simple pendulums are very clumsy to use for this purpose since the bob, once started, will go on oscillating and will not respond to the quick succession of movements which accompany an earthquake. Any vibrations having the same period as the pendulum will set up resonance phenomena. In order to be able to record the ordinary waves—*e.g.*, P. waves with a period of 6 or 7 seconds—we require a pendulum with a period of, say, 10 seconds, but a pendulum having that period will have a length of 25 metres!

The simple pendulum has therefore to be modified so that it will have a long period with a manageable length. It must also be capable of responding to, and recording, each on-coming pulse with as little interference from previous motion as possible. Since the actual movement may be of microscopic dimensions, it will have to be magnified by a suitable device.

*Damping.*—The accurate recording of each pulse depends on the elimination of the motion due to the previous pulses. This is called damping, which may be accomplished by attaching a vane to the steady mass of the instrument, the vane dipping into a small pool of oil. Oil damping is effective, but susceptible to temperature changes. In magnetic or electro-magnetic damping, a vane or conducting coil is attached to the boom of the instrument, the current induced in these controlling the movement of the pendulum. The amount of damping to be used depends on the type of instrument and the damping ratio (*i.e.*, the ratio of two successive half-amplitudes), which latter may be adjusted as required. In critical damping (ratio 20 : 1) there is no over-swing past the position of rest. The damping ratio is high in instruments intended for use in seismic areas and low in very sensitive instruments which register distant earthquakes.

*Magnification.*—In one type of instrument in which the steady mass is heavy, the magnification of the actual motion is achieved by means of levers and the record is made by a stylus on smoked paper. In lighter instruments the magnification is optical, by means of galvanometer and mirror arrangement, and the recording is done on photographic paper. The recording paper is wound on cylindrical drums which are unwound by automatic and accurately controlled clock-work arrangement. Time marks (relative) are made auto-

matically on the record and the absolute time may be marked either with the help of a chronometer or radio time signals. A large number of seismographs have been designed. For recording all the motions, three instruments are needed, two for horizontal movements at right angles to each other and the third for vertical movements. A good research station will require different types of instruments so as to be able to gather all possible information. The sensitiveness, period and magnification differ in different types of instruments and therefore there is no single instrument which can satisfy all requirements.

Several types of instruments are available for the measurement of horizontal vibrations, but only a few for vertical movements. The instruments have to be properly located and housed, avoiding structurally unsuitable ground. They are mounted on concrete piers erected on as good foundations as can be secured, and the piers are isolated from the flooring of the building so that the vibrations reach the instrument only from the ground and not from the building.

One type of seismograph uses the principle of the horizontal pendulum, the boom being horizontal and hinged to a vertical support like a gate. The Milne-Shaw instrument is an excellent example of this. Its period is 12 seconds, and because of this it is affected by tilt. In the McComb-Romberg type the tilt is compensated for. The Galitzin and Wenner seismographs use galvanometric recording and electromagnetic damping. In the Benioff seismometer, the mass is cylindrical with its axis horizontal, supported by several diaphragms and wires. The Wood-Anderson instrument, developed at Pasadena, has a small cylindrical mass attached eccentrically to a vertical fibre under tension and can record very short to moderate period vibrations and magnify them suitably. It is well suited for use outside the earthquake belt and for distant earthquakes. The Wiechert instrument employs the the principle of the inverted pendulum, the mass at the top being free to vibrate in any direction, and kept in equilibrium by spring supports near the top. As this uses levers for magnification and smoked paper for recording, the mass has to be sufficiently heavy to make the friction negligible. Three types of this instrument use masses of 80 kg., 1 ton and 17 tons respectively. The De Quervain seismometer has a simple pendulum arrangement with short period but occupies much space and weighs several tons.

For recording the vertical component, Galitzin, Benioff, Wiechert and De Quervain instruments are available. They have

all spring-balancing arrangement which is affected by temperature changes which are difficult to control.

*Records.*—If there is no movement of the ground, the record is a straight line. Seismographs installed in or near cities cannot entirely eliminate the minute vibrations due to traffic and other causes, but these do not affect the record of earthquake movements appreciably. The commencement of an earthquake is marked by a sharp bend and is followed by a wavy line of varying amplitude and duration depending on the peculiarities of the earthquake. The first waves to arrive are the P waves and then the S waves. The surface waves arrive last but they have a large amplitude and are responsible for practically all the damage which severe earthquakes cause. Reflected and refracted waves can also be clearly recognised in records made at stations sufficiently far from the epicentre.

The direct 'body waves' have a greater velocity at depth than near the surface (see table below). They die out at a distance of 105° from the epicentre, because beyond that distance they are refracted by the core of the earth and reappear clearly at about 140° from the epicentre. These refracted waves are however of the P type, the S type waves not being clearly recognised among them. It is therefore inferred that the core is not capable of transmitting distortional waves *i.e.,* it behaves like a liquid.

VELOCITY OF PROPAGATION OF BODY WAVES

(after Sieberg and Jeffries)

| Depth km. | | Zone. | Velocity in km. per second. P | S |
|---|---|---|---|---|
| | 0 | Surface— | | |
| | | (a) upper (granite) layer | 5·5 | 3·3 |
| | | (b) intermediate (basalt) layer | 6·3 | 3·7 |
| | | (c) lower (dunite) layer | 7·8 | 4·3 |
| below | 60 | | 8·0 | 4·4 |
| | 1200 | Lower limit of Barysphere | 12·5 | 6·75 |
| | 1700 | | 12·75 | 7·25 |
| | 2450 | | 13·25 | 7·5 |
| above | 2900 | Upper limit of core | 13 | 7·25 |
| below | 2900 | | 8·5 | 5 |
| | 6370 | Centre of earth | 11 | 6·25 |

The surface waves have a velocity of a little over 3 km. per second and their period may be anything up to nearly 1 minute.

The Rayleigh and Love waves can be separated if the horizontal seismograph is so placed that its direction of movement is the same as the direction of travel of the waves. The presence of Love waves is proof of the inhomogeneity of the crust. From geological evidence also we gather that there are different layers dominantly composed of particular rock types like granite, basalt or other basic rock. There is evidence in good seismograph records to show that the waves are refracted at the interface of the layers, travelling parallel to the interface and again being refracted up to the surface. The direct wave arrives first at short epicentral distances whereas the refracted wave arrives first at greater distances.

The arrival time of the various waves at different stations have been of use in the determination of the nature of the interior of the earth. It is now generally agreed that there is a layer of granite beneath the thin sedimentary shell and that rocks of the nature of dunite (composed of olivine, an orthosilicate of Mg and Fe) occur further down. There is also evidence that, between these two, there may be one or two intermediate layers. Two distinct discontinuities are recognised at depths of 1,200 km. and 2,900 km. respectively. Between these two limits the nature of the material is purely a matter for speculation. It has a density of 5.5 to 6 and may be composed of the base metals and their sulphides and silicates. Below the depth of 2,900 km. and down to the centre of the earth the material seems to have the properties of metallic iron or a nickel-iron alloy, with a density of 8 to 9.

From the available data it has been calculated that the granite layer is about 10 km. thick and that each of the two intermediate layers has a like thickness. Geological evidence points to the preponderance of basic rock underneath the ocean-basins, and especially in the Pacific. At present there are only four stations in the Pacific, *viz.*, Honolulu in Hawaii, Apia in Samoa, Suva in Fiji, and in Guam, which are inadequate for tackling the problems arising in that vast area.

*Location of the epicentre.*—The distance between the point of observation and the epicentre is estimated by the time interval between the arrivals of the P and S waves. Satisfactory time-distance curves are now available which are used in these estimates. But there is always some uncertainty since earthquakes occur at various depths below the surface, and since the velocities of the waves differ according to the depth of origin. The approximate time of origin can be deduced by attempting to fit the various phases to the appropriate curves. The data for two other stations are

obtained and the respective distances deduced. When three such distances (for three different stations) are available, these can be marked off on a large globe by tape or compass, the intersection being the epicentre.

The actual direction of the epicentre from the recording station can be determined from the P waves. Since these are compressional, the associated movement at the observing station is directly towards or away from the epicentre. If the instrument is not set exactly in the direction of the movement, the proportion of the two horizontal components will give the true direction. If similar information is available for another station, then the epicentre will lie at the interesection of the two directional lines. In the special case where two stations have the same arrival time for the P waves, the epicentre will lie on the perpendicular to the line connecting the two stations, and either the direction or distance from one station may be used to locate the epicentre.

*Depth of focus.*—The travel times for the P and S waves for a very large proportion of earthquakes is very nearly the same in whichever part of the world the epicentre lies. This is because most of the earthquakes occur at a small depth from the surface and slight differences in depth introduce no marked variation in the velocity of the waves. In a number of cases, however, stations at long distances record the early arrival of the waves— *e.g.*, P waves arrive 30 seconds too early at an epicentral distance of 90°. This fact is now well established by observation, the explanation being that the waves have greater velocities at depth and therefore arrive earlier than waves having a smaller focal depth. In ordinary earthquakes the depth of the origin is within 25 km., and mostly within 15 km. Some of the earthquakes in the sea off the coast of the Dutch East Indies are known to have depths of about 100 km. Some shocks in Turkestan have occurred at 200 km. depth. Stechschulte has calculated that the Japanese earthquake of March 29th, 1928, originated at a depth of 410 km., while Brunner found that a shock which originated in the Pacific north of New Zealand, on May 26th, 1932, had its focus 550 km. below the surface. Deep focus earthquakes have surface waves of small magnitude and are therefore less destructive than shallow focus ones, though they are felt over much larger areas.

*Microseisms.*—Sensitive instruments record not only the vibrations produced inside the earth but also those arising on or near the surface. The latter include some volcanic phenomena, explosions, storms, cyclones, etc. Though these may cause enor-

mous loss of life and property, the vibrations caused by them are of negligible intensity. The explosion of the volcano Krakatoa in the year 1887, in which about a cubic mile of rock was blown off from the surface, was heard over a distance of several hundred miles and produced destructive tidal waves, but the earth vibrations caused by it were feeble. The Oppau explosion in Germany (September 21st, 1921) was recorded by very sensitive instruments only, beyond a distance of 150 km. Similarly, fierce storms which may strike the coast with destructive violence produce only very weak vibrations in the earth.

*Effects of earthquakes.*—Earthquakes which exceed a certain intensity are felt by human beings. The violent ones destroy life, work havoc on buildings and other structures built by man and cause widespread changes on the surface of the earth. They are usually accompanied by sounds which may resemble a rumbling noise, whistle, roar, etc. The actual motion may be a tremor, shaking, rocking or something more violent. The duration of the shock may vary from a few seconds to about a minute or more in rare cases.

Buildings are affected to different extents according to the intensity of the quake and the capacity of the structures to resist damage. Fall of plaster, development of cracks, breakage of projecting parts, partial or complete collapse—these represent the effects of increasing severity of the motion.

In very severe earthquakes, the ground becomes cracked and fissured. Faults open up with or without relative movement of the two sides (Allah Bund in Cutch, 1819 ; fault in Khojak hills, Baluchistan, 1892 ; San Andreas fault, California, 1906, etc.). Landslides and dislocation of large masses from mountain slopes occur (Nepal, 1934 ; Kansu, 1930, etc.). Extensive changes may occur on the surface. Flooding or withdrawal of water from parts of alluvial areas are common. Water squeezed out from the strata flows out in spouts and leaves small crater-like mounds on the surface. Roads and railway tracks become disjointed, broken up or twisted. Bridges may be destroyed and the piers may be pulled apart or pushed towards each other. The drainage is altered, necessitating extensive reclamation schemes. Alluvial areas are prone to suffer very heavily because of the inhomogeneous and weak nature of the strata.

Strong earthquakes affecting cities not only cause direct damage but the indirect effects may be very severe. These include the com-

plete dislocation of water supply and the breakage of gas pipes and electric mains, often accompanied by disastrous fires. (Tokyo, 1923).

Tidal waves are generated in seas if the shock occurs near the coast. These travel long distances and cause severe damage to the coastal areas encountered by them. As they reach the shore, they become solid walls of water because of the top travelling faster than the bottom on a shelving shore. Tidal waves have been very destructive in the Lisbon, South American and Japanese earthquakes. (Lisbon, 1775, 30-60 ft. high; Lima, 1724, 80 ft.)

*Origin of earthquakes.*—Earthquakes are due to local disturbances of equilibrium which set up elastic waves within the earth. The causes may be considered under three heads: *tectonic,* due to deformation of the crust; *volcanic,* due to the movement of liquid and gaseous products of igneous action; and *plutonic,* due to changes in the constitution of rocks at depth.

*Tectonic earthquakes.*—Structural changes in the crust, due to deformation, cause earthquakes. Most of these are probably due to movements along faults or open fractures. The faulting may be the result of tension (normal faults) or compression (reversed faults or thrusts). Normal faults often extend to, and are visible on, the surface. The Cutch earthquake of June 16th, 1819, produced a fault scarp (the Allah Bund) visible over a length of about 50 miles, the southern side being depressed relatively to the northern side. Numerous other cases can be cited from all parts of the world.

There are also cases of shallow focus earthquakes in which no faulting was visible on the surface. These may however be connected with hidden faults or thrust zones.

*Volcanic earthquakes.*—Eruptions of active volcanoes often cause earthquakes of slight to moderate intensity in the neighbouring region. They may be due to the sudden movement or stoppage of liquid magma in the interior, to explosions, outbursts of gas, or flow of lava, or may grade into the purely tectonic type. Violent eruptions or explosions like those of Vesuvius (79), Krakatoa (1883), Bandai San (1888), Mont Pelee (1902) etc., have enormous energy but the accompanying vibrations are feeble. Volcanism was formerly held to be the major cause of earthquakes. This is partly due to the fact that the earth's volcanic belt coincides to some extent with the seismic belt (*e.g.,* in the East Indies, Japan, Alaska, South

America), and that volcanic and seismic phenomena sometimes occur together in the same region. It is now recognised that tectonic disturbances and volcanism are interconnected and the former may, in some instances, precipitate volcanic action. Hence, earthquakes in volcanic regions may often be more complex in origin than would appear at first sight.

*Plutonic earthquakes.*—Earthquakes of deepseated origin have been studied by R. D. Oldham, H. H. Turner and others. A depth of focus of as much as one-sixth to one-fifth of the earth's radius has been postulated by G. W. Walker (Phil. Trans. Roy. Soc. A *222*, 1921, p. 45-56), but this has not met with general acceptance. Recent studies show that the depth may be as much as 550 km.

Such earthquakes are mostly confined to the circum-Pacific belt, an important region outside it being located in Turkestan. Deep earthquakes are probably due to changes taking place in the character and composition of rocks. The changes may be of the nature of recrystallisation of one rock type into another as postulated by Sir L. L. Fermor (Geol. Mag., Feb., 1914, p. 65) or some other type of molecular transformation involving change of volume. The periodical release of accumulated stresses will give rise to earthquakes.

*Geographic distribution of earthquakes.*—When earthquake catalogues were compiled, it became clear that certain areas of the globe were frequently affected by earthquakes and others were comparatively free. There are two main belts which show great seismic activity, *viz.*, the borders of the Pacific Ocean and the region occupied by the Alpine-Himalayan mountain systems. These show geologically young folded mountains arranged in a series of arcs whose convex sides are bordered by deep troughs. Adjustment of equilibrium is constantly taking place in these areas and hence the earthquakes.

*Earthquakes in India.*—The distribution of earthquakes in India and the structural peculiarities of the seismic areas formed the subject of a recent address by W. D. West (Presidential address to the section of Geology, 24th Indian Science Congress, 1937). The active region is the Tertiary belt forming part of the Himalayan chains and their extension into Burma and Baluchistan. The Burmese region extends into the East Indies whereas the Baluchistan one continues into the Mekran and Southern Iran.

The Himalayas have been formed by the compression and folding of marine sediments formed during earlier ages. The

folding took place during the Tertiary era, accompanied by thrust faults of great magnitude. There is evidence that the movements persisted until geologically recent times. The Indo-gangetic plains in front of the ranges represent a large filled-up depression whose origin is bound up with the history of the Himalayas. The whole belt is gradually settling down to equilibrium.

The Peninsular part of India is comparatively free from earthquakes. It is a region containing a large number of faults including trough faults. Shocks of small intensity occur along the Eastern Ghats and on the western coast, but they are never felt beyond an area of a few hundred square miles at the most.

Several intense earthquakes have occurred in India in recent years. The Assam earthquake of 12th June, 1897, was one of the severest in history. The Kangra earthquake of 4th April, 1905, was also a destructive one, with two epicentral tracts. A series of moderate to severe shocks was felt in Burma in the tract bordering the Shan Plateau to the west, between 1929 and 1931. The Dhubri area in Assam suffered heavily when it was visited by an earthquake on 3rd July, 1930. The Bihar-Nepal earthquake of January 15th, 1934, is still fresh in the minds of the inhabitants of north-eastern India. It is noteworthy that the same area was affected badly in the year 1833. The latest severe earthquake was the one which caused great loss of life and property in Quetta and its vicinity on May 31st, 1935. There have, of course, been a large number of moderate to weak shocks in various parts of the earthquake belt most of which go unnoticed by the public at large because they have no spectacular effects. The severe earthquakes are invariably followed by a large number of aftershocks which may persist for months or even years.

It is rare that two severe shocks occur at the same place consecutively. The earthquake foci migrate from one place to another along the seismic belt, but the same area may be visited repeatedly at intervals of several decades.

Taken over the whole face of the globe, some 9,000 shocks are recorded every year, or approximately one every hour. Approximately half of these are instrumental shocks, *i.e.*, too feeble to be felt by man. About 100 shocks may cause some damage, while 20 may be classed as destructive. Two-thirds of the destructive shocks (about 13) have their origin in the oceanic areas and the rest (7) on dry land.

*Building Construction in Earthquake Regions.*—During an earthquake the ground is set in motion but the velocity acquired

by it is not uniform. Standing objects can easily adjust themselves to uniform motion but not to motion subject to acceleration. Under constantly changing velocity, buildings begin to rock and sway, and the centre of gravity becomes shifted, leading to the rupture of the weak parts. The factors which affect the stability of structures are the natural period of vibration, maximum amplitude and acceleration, range of variation in velocity and the duration of the motion.

If the period of vibration of a building coincides with that of the chief vibrations of the ground, resonance phenomena come into play and the motion of the top of the building may reach dangerous proportions. To avoid this, the period is made smaller (*i.e.*, the buildings are restricted in height) and the structure is made rigid by proper reinforcement. Longer period may be adopted if the building is very flexible. Short period structures are affected by the maximum acceleration, while large amplitude is the most serious enemy of long period structures.

Buildings and other structures (bridges, dams, monuments, etc.) must be designed and erected with a full knowledge of the seismic activity of the area concerned. Unfavourable locations such as fault zones, sloping ground and flanks of hills, and the proximity to junctions of different types of formations are to be avoided. If located on a fault, buildings will be torn apart when there is relative movement on both sides of the fault. Sloping ground may slide and slump under the influence of vibrations and gravity. If two formations have very different physical properties such as rigidity and elasticity (e.g., an igneous rock and a sedimentary rock, or a hard rock and soft alluvium) they vibrate with different periods and amplitudes, and structures located over their junction will be badly and unevenly shaken.

It is well known that the period, amplitude and acceleration of motion in solid rock are magnified several-fold when the motion travels into soft alluvium, or made-up (i.e. filled-up or reclaimed) ground. Hence, buildings on soft ground must be made stronger than those on well consolidated hard rocks.

A great deal of work has been done with regard to earthquake-resistant structures, especially in Japan. Building design includes a seismic factor, i.e., resistance to horizontal acceleration which is generally expressed as a ratio of the vertical acceleration due to gravity. Buildings in which a seismic factor of one-tenth of gravity was allowed for have withstood the effects of severe earthquakes in Japan and other countries. Even in soft ground, where a horizontal acceleration of 0·2 to 0·3 of gravity was measured, such

buildings have escaped damage probably because the duration of the maximum acceleration was very short.

In reviewing the effects of the Baluchistan earthquake of 1935, W. D. West (Rec. Geol. Surv. Ind., LXIX, pp. 204-240) has remarked that the main defects of the buildings in Quetta were weak construction and height. The same will apply in a large measure to all towns over the whole of the earthquake belt of India. The heavy loss of life and property in Quetta has necessitated the adoption and enforcement of a building code for that area and all building operations must conform to the regulations. It is said that a seismic factor of 4·8 ft./sec.$^2$ is used in the Military Department buildings. Japan, New Zealand, Mexico, California, Italy and Greece have adopted earthquake-proof designs for construction in seismic areas, and there is ample evidence of the usefulness of such design. It will therefore be necessary to adopt similar measures in all parts of India subject to earthquakes, if heavy losses are to be prevented in future.

*Earthquake Prediction.*—There is popular belief that earthquakes are caused by certain planetary combinations. All that can be said at present is that tidal forces due to the attraction of the sun and moon and local atmospheric pressure may act as trigger forces, that is to say they may accidentally contribute to the release of accumulated strain which would have found outlet in any case.

Some earthquakes are preceded by foreshocks which may come a few hours or even days ahead. Others have occurred without any warning at all. In the present state of our knowledge, the occurrence of earthquakes cannot be predicted with any chance of certainty. If premonitory shocks are recorded in a region which has been comparatively quiet for some time, the probability of an earthquake in the near future is indicated, but the time of occurrence will be matter of guess work. Intensive research, with the help of accurate recording instruments and over a long period, may however enable us to gather enough data for each region to predict earthquakes in future.

# WORLD PICTURES

By

Rev. J. B. Freeman.

At times in the course of one's life, one is inclined to be more than usually meditative, and the lines of thought run into philosophical channels. Practical problems and topics fade, as it were, into the background; one begins to probe more deeply into the meaning of life. Even the ordinary intellect, which in supreme moments dwells on the infinite, is "rocked in the cradle of the deep": the mystery of Being, the whence, the whither, the how and the why of existence. One mind dwells longer on these problems than another, one delves deeper into it than another; and although in general men have not sufficient time, or training, or aptitude, or even the inclination, for continuous philosophical contemplation, yet everyone is influenced some time or another by a metaphysical mood, and the utterances of some famous scientist or learned man will somehow attract the attention. This is true even of the human race as a whole; at some periods metaphysical speculation is more indulged in than at others; and while at one time they are placed entirely in the background still the same problems crop up again and again, to show the inherent importance attached to them and the interest they bear in themselves. Such periods generally occur when some being of extraordinary personal authority and esteem makes certain profound statements bearing on these questions, or when in the realm of physical phenomena some discovery has been made which would overthrow previous physical theories in such a way that metaphysical conclusions supposed to have been intimately associated with them are also shaken.

It would seem that at the present day the reason for more than usual interest taken in metaphysical problems is the latter one mentioned above. However, we are not in want of utterances bearing on these questions by men whose fame and personal influence in the realm of science are carried over, as it were, and bring a great deal of weight to bear on these matters. We live in an age of vigorous mental activity, as shown not only by the wonderful inventions recorded in the last two generations, but also by the novel and revolutionary theories proposed.

The recent discoveries of science may be generally stated as those of Astronomy, of Physics, and of Biochemistry. Investigations into stellar constitution and distances, into molecular, atomic and sub-atomic structure, and electro-magnetic phenomena, and into elementary living structures have led to results which could not be satisfactorily explained by previously existing theories.

In some scattered articles of his the writer has considered number, space and time ; and he has stressed the point that these are mere abstractions from the reality. He believes that it cannot be over emphasised. Moreover, all these concepts put together will not make up the reality. The reality exists apart and is the basis of our abstractions.

An abstraction, considered as the concept itself as distinguished from the act of the intellect, implies the direction of the attention to one particular aspect of a thing not considering the others or attending to them. The thing itself presents us with so many aspects of itself, that we are not capable of considering them all together, and we are constrained therefore by this limitation to consider each one separately even though in the thing itself they necessarily exist together and dependently on each other. The simplest concepts are evidently the more common and universal. These are, for example, the concepts of being and unity. The proper and immediate objects of our intellect is the "thingness" of some physical object as abstracted from the individuating conditions, and this it must recognise only as existing in some particular object ; but the intelligible species is not wholly representative of the particular object, i.e., there is no single concept fully expressive of an individual object. However, a particular thing can be distinguished by a connected group of concepts, which by its complicity would correspond to that thing without any ambiguity.

A "universal" is opposed to a "singular", which signifies something not shared by or applicable to more than a single entity. Hence a universal is a general term applied to anything which has reference to many. This it may have either by significance or by causation or by existence. A universal by significance or representation is one in which many are expressed as in one image ; a universal cause is one which can attain several effects ; a universal in existence is one which is apt to be in many and which consequently can be predicated about many.

In the concept of a universal is involved a unity in itself and an aptitude to be in many. The unity is one not only in the name,

but also in the entity which is signified by the name, and which must be in the thing, somehow contained in it. A threefold aspect may be taken of this entity; according as it is in itself pure and simple, or according as it is in the individual thing, or according as its immaterial existence is in the intellect by abstraction. As it is in the singular thing it is individuated, and can be called universal only fundamentally, potentially and remotely, in-as-much as it is the basis for that concept which is in the mind and which formally receives universality by a further operation of the intellect. As the reality itself corresponding to the concept, the entity is, properly speaking, neither universal nor singular; it is singularised by the individuating properties of the thing, and becomes universal by the operation of the intellect; it can therefore be called universal, fundamentally, potentially and proximately, for this is what is abstracted by the intellect. It exists in the mind by *abstraction*, i.e., prescinding from individuals and individuating conditions. To this abstract universal is sometimes restricted the term "metaphysical universal"; and by a further operation of the mind it becomes the "logical" or "relative" universal. The metaphysical differs from the logical universal in-as-much as it signifies something abstracted from singulars *irrespective of its applicability to the many*; it is one abstracted from the many. Whereas the logical universal has this applicability to many in consideration; it is one applied to the many; the abstraction and the application being of course both operations of the intellect. Again, whereas the metaphysical universal stops with this abstraction, the logical requires in addition a comparison, since the many are the *terminus ad quem* to which it refers, the relation consisting primarily in its predicability about the many. A logical universal exists as such, i.e., formally as a universal, *only* in the mind, but a metaphysical universal in the more general sense exists both in the thing as well as in the intellect; in the thing, as a constitutive entity which is the basis of the concept, existing, however, concretely and determinatively; in the intellect, according to the manner in which it is known, i.e. abstractly and indeterminately. Hence Universals, whether logical or metaphysical, are neither pure names nor pure concepts.

The concepts abstracted from a thing are after all few as compared with the complexity of the sum-total of the "knowables" of the thing, and this is one reason for stating that the concepts, for example of space and time and quantity, all put together do not make up the reality. If, therefore, we enter into metaphysics with a meagre armament of these universals, and argue that the thing and our concepts are identical, or pessimistically assert that we cannot know things as they are in themselves outside the mind,

or optimistically affirm that the latest theories tell us everything concerning the nature of things, we are just deceiving ourselves by *misunderstanding* the relation and neglecting the distinction between the thing perceived and the perceiving mind. It is a great thing to be able to abstract, to extract, as it were, universals from individuals; in fact, it is the characteristic of the human intellect; the more abstractions we make, the more we progress in knowledge. To confound, however, the real thing with the abstraction or with a sum of abstractions is like identifying coffee with a taste. The product of the intellection is a complicated intelligible species. It is like a tangled skein of coloured wool in which it is difficult to follow the course of each strand; it is like a star cluster easily seen as a whole, but of which it is difficult to fix the gaze on a single scintillating point. It is vague because the elements are not singled out, like a forest seen at a distance. It is difficult to assimilate it and retain it to be a pre-intellection for later use, because it is complicated and its complication gives it a singularity of its own; and we fail to accept it as familiar for it has little in common with other complicated intellections. We need to unravel the tangled skein and separate the strands, to lay side by side one of them with a strand of a like shade from another tangled skein. We need to see singly the trees, at least some of them, in a wood in order to recognise them as having been seen in another wood. To separate a single element from the complicated intellection is an "isolation" of it. To isolate concepts is facilitated by comparison and contrast. When we have two tangled skeins of threads of different colours and shades we can perhaps detect two threads of like shade one in each skein and draw them out. Contrast would help us to single them out. Still more easy would it be if we compare a skein with threads already singled out and sorted. So it is with concepts. This, we venture to say, is the process we undergo from the moment we come forth into the world. There is intellection from infancy onwards, but isolation—the unravelling of the elements—is slow and laborious.

However, what we generally isolate is not a single *elementary concept,* i.e., one which cannot be split up into simpler ones. By comparison and contrast we are able to isolate simpler groups from the complexes intellected, and the breaking up of any such group into still simpler ones requires more comparison and contrast. This it is our continuous effort to achieve, right down to the elementary concepts which cannot be split up further: the supreme epistemological process of human thought, the very core of science and philosophy and theology.

To split up the apprehended complex is to "analyse", and to set up the elements together again in their order and relation to similar elements in other complexes and in themselves is to "synthesise". Man would have reached the final stage of mental progress when he has analysed all his concepts into their elementary ones, and recognised again the synthesised complexes. Each individual can contribute a share in the task, but that of any one can only be infinitesmal. It needed all the intellections of all men down through the ages up to the present time for the results so far attained—insignificant in comparison with the final goal. Progress, however, becomes more and more rapid as time goes on like the speed of a stone falling to the earth; for the work gets simpler as we proceed and deal with less and less complicated concepts. In Mathematics the epistemological process has been explicity in progress for over a century, and with its definite acceptance in Physics and the other sciences we have witnessed some remarkable results in recent years. When we say that space is three-dimensional, all we mean is that we have isolated a three-dimensional concept from our complicated notion of it. We apply this concept again to obtain our deductions. That space and time cannot be dissociated, according to the Theory of Relativity, would only imply that a more complex concept would correspond more accurately to the nature of things about us. When we reason from our universals and arrive at our conclusions, these conclusions will apply to the reality *in the same way and with the same limitations* as the universals do. Universals exist in the thing in one way and in the mind in another; and if this distinction be not borne in mind we shall inevitably be led on to subjective idealism.

We must note that isolations can be made from inexact observations. There is nothing that is perfectly smooth, but we can and do obtain the concept of smoothness; nothing perfectly straight, yet we have the concept of perfect straightness; nothing perfectly good or beautiful, but we do have concepts of goodness and beauty. When we attribute the concept to a thing we do so with the consideration that it is *but one ingredient in the complexity of concepts corresponding to the thing.* For a legitimate application the thing itself must, as a primary requisite, provide the basis for the attribution of the universal to it.

Concepts are called "transcendental" when they are applicable to all things whatever, e.g., the concepts of "being", and of "unity". The universals of Mathematics are isolations from such properties of things as would in their own way limit the *absolute*

application of the concept to any one thing. Such concepts are in themselves absolute; they are incapable of comparison. We do not speak of more "straight"; "more of a number", "more continuous"; a pair of chickens is not more "two" than a pair of gloves. (N. B.—Each number is a concept in itself, so also the number-system, its compactness, its infinitude, etc.) Such concepts are not, however "essential" concepts, for the reason that they do not express the essences of things. Essential concepts are not affected by individuating properties, and are attributed to a thing formally, wholly, and in the same manner to the different members which are classed in the same *species*. A mathematical concept, on the other hand can be attributed to a thing in the manner that we choose to do so; but if a number be attributed to a thing it must be referred to it under a certain aspect; a thing cannot be one as well as two under the same aspect.

As examples of isolation made in the sciences we give the following: unity, plurality, the integral numbers, the positive rationals, zero, the negative numbers, the continuum of reals, limiting values, continuity, infinity, the complex numbers; all algebraic operations and symbols, arithmetical and algebraical laws; every extension in the meaning of an operation or symbol; the point, the straight line, the plane, co-ordinates, frames of reference, points of view, the space-time continuum; the classical Laws of Mechanics, the Restricted Principle of Relativity, the General Principle of Relativity, the Quantum Theory, The Laws of Thermodynamics, the Particle Theory and the Wave Theory of matter; the laws of heredity, life, the so-called laws of supply and demand in Economics, etc.

If we say that any one of these, or some, or even others not mentioned, express all that we know of Nature, our outlook of Nature would indeed be very narrow. Moreover, it would not be any wiser to identify these abstractions with the things themselves of Nature; it would be like identifying a ten-rupee note with "goodness", because it is good in a way. There is certainly a correspondence between a concept and the reality. "A thing does not act where it is not", is an axiom which the Principle of Relativity as well as the Wave Theory has again incidentally reinstated if not implicitly assumed; by this principle a thing must be in the knowing mind in some manner, and since it is not there in its physical being, it must be there in its intellectual species. The Universe as known to us by these concepts, generalisations, and laws, is in our mind in a way differ-

ent from but corresponding to what it is in itself. There is little excuse for the following loose statements; the universe is nothing but waves, the universe is only a soap-bubble, (whatever that might be); the world-lines of observers are just strings in a lump of jelly. The universe, waves, soap-bubbles, world-lines, observers, strings, jelly, are all mere concepts in this kind of statement; isolations from the most complicated concept of the Universe, intended to draw up before the imagination pictures of what cannot be imagined or visualised.

Somebody may ask: if these laws and notions be mere concepts and not the things themselves, how is it that we are able to calculate so exactly, and measure and predict phenomena? Would these operations also be mere illusions? Firstly, let it be noted that concepts are not illusions. That we can and do arrive at conclusions which agree with observable phenomena is naturally rendered possible by the mutual correspondence between our ideas and reality or the physical world. The mental picture is a picture after all of the reality. A landscape portrayed on canvas with oil paints consists of canvas, chemical colouring matter, oil; it is not the real ground, grass, trees, water, etc.; but there is a real correspondence between the picture and the place represented. It is, however, a very meagre picture.

A "theory" or hypothesis, or postulate, or assumption,—whatever we might call it—is put forward primarily to explain phenomena not satisfactorily accounted for before, to suggest new lines of research, to predict phenomena verifiable by observations; and more than this to co-ordinate disjointed and apparently unrelated phenomena. If a theory does all this it has a "*raison d'être*" The theory itself must follow the classic adage "entia non sunt multiplicanda sine necessitate," by making as few assumptions as possible. An assumption is an isolate. It stands on an insecure basis if it is *supposed* to be an element in a complex notion *not yet analysed.* Conclusions derived from it are equally dubious. Caution is often cast to the winds by those who would rush hastily forward, and they who would obstinately and foolishly assert that their own pictures of the universe correspond *exactly* to the reality are little to be respected.

The more closely our observations fit in with our theory, and the more accurately we can predict the more we should be led to the conclusion that we are applying a more complex set of concepts, analysed and synthesised anew, to the reality than before. For example, in measuring the distance, between two points A and B,

we can do so along a fixed path, or we may assume the surface on which the points lie to be plane or spherical, or paraboloidal, each time with a more "accurate" result; we may assume the lengths to be unaltered by motion or by time, or to be altered in a particular way; we may disregard the existence of a gravitational field, or take it into consideration. These assumptions are, however, only isolations, one more complex than the other. The Particle Theory insisting on the coarse-grainedness of Nature, and the Wave Theory smoothening it down are also isolations, each probably a partial truth.

When I isolate and get a universal, and later apply this concept again to the reality, the questions that arise are not only: is my isolation true? Is the assumption that it is an element of another complex correct? but also and rather: How much does the single concept fall short of the sum-total of knowables of the thing? It may be remarked that modern theories are just complex sets of concepts put together with the object of being more conformable with the refined measurements now-a-days possible than were the less complex or vaguer systems of previous hypotheses.

It must be carefully noted what kinds of universals we deal with in the sciences. The mathematical concepts are universals in the logical sense only; in the other sciences, a universal is sometimes considered in the metaphysical sense as it is in the intellect and sometimes in the logical sense. It is on this account that philosophical confusion often arises. In mathematics all definitions are nominal in the sense that names are given to concepts. A concept beginning as a universal in the early stages of the science is made more and more universal by the extension of the application of the name. The universality is not now the aptitude of being in and being predicated about many real entities, but of *being included in many less simple concepts.* In this way the applicability of a term e.g., "number" is extended more and more with the needs of the subject by an operation of the intellect in order to unify and co-ordinate the subject. In no case is there any opposition to the older or less simple concept. The extended concept is really more isolated being in fact an isolation from isolations. In the physical and other experimental sciences (which should deal primarily with metaphical universals) by the introduction of mathematical ideas and methods of treatment, universals have become to a great extent logical, and the extension of the application of terms tends to be made on purely logical considerations as in the case of Mathematics. It is for this reason that if "you ask the

new physics to specify an electron for us, it does not give us a mathematical definition of an objective electron," (we assert that mathematics does not ever give *definitions of 'objective things'*) "but rather retorts with the question, 'How much do you know about the electron in question?' We state all we know, and then comes the surprising reply, 'That is the electron!.'" (Sir James Jeans in his Presidential Address at Aberdeen before the British Assn., for the Advancement of Science, 5 September 1934). In other words Physics at present also makes use of nominal definitions. The electron in the mind is an analysed and synthesised set of concepts sufficiently characterising it and distinguishing it from all other complex sets.

To continue with the quotation: "The electron exists only in our minds—what exists beyond, and where, to put the idea of an electron into our minds we do not know. The new physics can provide us with wave-pictures depicting electrons about which we have varying amounts of knowledge, ranging from nothing at all to the maximum we can know with the blunt probes we have at our command, but the electron which exists apart from our study of it is quite beyond its purview." This, however, is an agnostic attitude. The reality is indeed within our purview, and the only possible and natural purview of it consists of all the branches of human knowledge. Why deny the reality of that of which we have formed a mental picture. The picture, however, is only partial and incomplete.

The trouble arises from the fact that a mathematical concept obtained firstly from the nature of things is extended according to the needs of the subject by analysis and isolation in such a way that the physical significance, that is, the direct and immediate applicability to things, is lost sight of. It is an isolation from isolations, as we remarked above, and there is no visual picture corresponding to it; whereas an extension of a purely physical concept of a thing is a combining together of elementary concepts as a complex whole approximating more to the sum-total of the knowables of the thing, and therefore corresponding more closely to the reality. If the physical extension had been made on purely logical considerations, then there can be no visual picture corresponding to the extended meanings of terms. *The fundamental difference between the mathematical and the physical sciences consists in this: in the former progress is made from the most isolated concepts; the more isolated and elementary they are the further do mathematics develop, and the whole of mathematics is the synthesis attained,*

Whereas the physical sciences can only proceed from synthesised sets of concepts, for a physical object corresponds more with a set of concepts than with a single elementary one, and the greater is the correspondence the greater the number of elementary concepts unified into the set. Mathematics are the auxiliary of physics for the treatment of the simplest isolates, but only so far and no further. They cannot replace Physics, for Mathematics cannot deal with such complex sets and with non-mathematical real relations between the elementary concepts in a set. Further, concepts are not merely mathematical and quantitative but also qualitative and have non-quantitative real relations between them. There is a limit to a physical extension of a term. A physical concept is extended by including in it all simple concepts so as to correspond as closely as possible with a physical object, but nevertheless isolated from as many individuating concepts as possible and particularly from the concepts of space and time. By this isolation from space and time the physical concept suffers from a want of *further* correspondence with the reality. However, it cannot be otherwise. Different sciences may treat of the same physical object but each with a different point of view, i.e., each science having its own set of isolates—the analysed-synthesised concepts—for itself. It is obvious that it is only all such concepts put together that will take us as near to the truth as possible, i.e., give us the closest mental representation of the reality. Man, for example, is treated very differently in the different sciences which profess to deal with him; anatomy, physiology, biology, anthropology; economics, sociology, psychology, etc.

We have already remarked that modern theories are just complex sets of concepts put together with the object of being more conformable with the refined measurements nowadays possible than the less complex systems of previous hypotheses had been, and thus also more capable of co-ordinating phenomena previously considered as unrelated. Modern Physics explains phenomena on the basis of two main theories: the Wave Theory and the Particle Theory, as they are called. The ultimate constituents of matter are considered either as waves or as particles. These waves and particles, however, are mathematical isolations very far from the *whole* truth and corresponding to no picture that the imagination can conjure up. The question: does matter consist of waves or of particles in the ultimate analysis? has no meaning, unless we know exactly what we mean by the terms used. If the question be about matter as it is in itself, the answer is that there is in the things about us a reality forming the basis for the 'wave' concept as well as for the

'particle' concept. If the question bore regard to "matter" as it is in the mind, the answer would be that it is whatever we choose to consider it, waves or particles according to the point of view. Closest to the truth would be the sort of answer given by the "New Physics" to our question about the electron.

Fundamental concepts are isolates from our intellection of things and are immediately applicable to things. A *set* of such concepts will apply to a much more limited number of things than will a single concept; moreover, it will certainly be nearer to the sum-total of the knowables of the thing than would be a single concept, and lead, and we have already remarked, to more accurate results. An hypothesis is not only a set of concepts, but it is also an assumption regarding the *interdependence of the corresponding universals as they exist in the thing.* It is this assumption that is put to the test; like gold it must stand the fire of very many stringent demands made on the modern hypothesis. It is the string which keeps the pearls together. If it be put into mathematical form, it can soon be subjected to a searching scrutiny, and will either be rejected or accepted provisionally until a better string be made of the same pearls, or more pearls be added and held together by a new string. Modern discoveries have gone so far that, in the words of Sir James Jeans, "the theoretical physicist must admit that his own department looks like nothing so much as a building which has been brought down in ruins by a succession of earthquake shocks."

"The truths (of Nature) can only be made comprehensible in the form of parables. Yet no parable can remain true throughout the whole range to the facts it is trying to explain. Somewhere or other it must be too wide or too narrow, so that 'the truth, the whole truth, and nothing but the truth' is not to be conveyed by parables. The fundamental mistake of the old fashioned physicist was that he failed to distinguish between the half-truths of parables and the literal truth." (Ibid.) Sir James means by a "parable" either a visualisable picture or a word which in its ordinary and every-day significance would correspond to a visualisable thing, but which by mathematical extension has become a pure isolation which cannot be visualised. In the words quoted, however, he seems to take his own words "parable" in both senses. The mistake of trying to visualise a mathematical concept, or of inventing a parable and then treating the parable as if it were the visible entity, is as much the fault of the modern scientist who poses as a metaphysician before the common people as of his predecessor. To pretend to

explain the investigations of modern science by simple pictures is an imposture. A baker knows more about a loaf of bread than he needs to learn or can learn from any sub-atomic physicist. He has a complex concept of it. Perhaps he has not abstracted the several elementary items in it; but he does not make the mistake of saying that half-a-dozen or more pure isolations put together make up that loaf of bread. If he has a concept of it he does not picture it as existing in the reality unless it be with individuating conditions as *this* loaf of bread. The Wave Theory presents us with a complex set of mathematical concepts which cannot be visualised or called a picture in this sense; the "waves" are strictly "mathematical" existing in four, six, and more "mathematical" dimensions.

To sum up: a mathematical concept is a logical universal; whereas a concept in the experimental sciences is a metaphysical universal as it exists in the mind with the further consideration that it can only exist individuated in the thing, or with the formal consideration of it as only an elementary part of the sum-total of the knowables of a thing. Only the simplest isolates can be given over to mathematical treatment and they must undergo firstly a change into logical universals. In the experimental sciences the aim is to make use of the universality in application and at the same time to obtain the common or most universal part of the sum-totals of the knowables of all existing things; to pick out, as it were, the highest common factor of all our complex concepts. Making use of this figure of speech, we see that the more we factorise the terms the higher the common factor we should get, and it is only when we resolve the terms down to their prime factors that we can get to the highest common factor of them all. Further, any additional term may upset everything and reduce the common factor even down to unity, unless we employ our energies again to factorise the new term.

An *elementary* concept is one in which we have the maximum common applicable to all the entities considered. The greater the number of entities considered the *simpler* will be the isolate (or set of isolates) common to all. The science of physics, for example, provides us with the terms to be factorised and with the motive; mathematics helps us with the factorisation of the individual terms. Physics, using mathematical symbols and generalisations, picks out the common factor, and then applies it to the terms again, to verify its observations, to predict new phenomena, etc. The common factor is the physical hypothesis in mathematical form. One hypothesis takes the place of another when new terms are put up for consideration, or when the factorisation of terms is carried

further than before. In this sense the older hypothesis was not wrong: it would have been wrong (and so would the newer hypothesis be) if it were considered to correspond exactly to the whole thing, i.e., to express not only not more but also not less than the whole nature of the thing. If we should call the common factor of *all* things "matter", the Wave Theory or the Particle Theory would hold according to the terms selected for consideration.

That Space was treated separately and Time separately in the "old mechanics" was not an error. It was necessary to make these isolations—to pick out, as it were, the simpler factors of the universe—and refine their separate concepts before making intimate connection between them as in the mathematico-physical space-time continuum, or the more generalised mathematical concept of a multi-dimensional continuum. Such a concept is no more a reality than any other abstraction; it exists as a universal in the mind, but outside the mind only fundamentally or as the reality providing the basis for the concept. In the mind it can be crumpled and twisted and warped, but the reality must provide the basis for these mental contortions. Matter exists in our minds as an abstraction in the same way as the ether, Newtonian force, and other concepts which Sir James Jeans classes as "unobservables"; by which he means perhaps entities imperceptible to the senses, whereas we should call them isolations. The very "determinism" resulting from the classical mechanics was itself an isolation, but incomplete and correct only within certain limits. Heisenberg's concept of the electron specified by matrices is supposed to be nearer to the truth than other less complex concepts. Let us take the word "truth" in the sense that it often seems to have in the minds of writers as the sum-total of the knowables of a thing, understanding a "knowable" as a universal in the metaphysical sense. This sum-total is the closest correspondence to the reality that can possibly be attained by the natural human intellect. "The whole picture, and the manifold dimensions of space in which it is drawn, become pure mental constructs—diagrams and frameworks we make for ourselves to help us understand phenomena." (Ibid.) Not purely mental constructs, but constructs of the mind with such an insufficiency of material and so weakly bound together as to correspond only a little with the reality.

What we are concerned with is not only the idealism to which philosophical speculations have led some scientists, but also the inevitable pantheistic tendencies of this idealism. The wave-electron is conceived as occupying the whole of space, and the two theories are more or less reconciled by Sir James Jeans by his

statements that where the wave theory makes its wave the most intense, there the particle theory also places its particle. Action at a distance is eliminated by the wave theory, which also satisfactorily accords with the coarse-grainedness of Nature as originally propounded by the Quantum Theory. Sir James Jeans deduces "determinism" from the Wave-picture, and, by placing the indeterminism of the particle-picture *in our minds only,* concludes that there is a determinism in reality. (Previously in his book "The Mysterious Universe" he had favoured indeterminism.) But are not the wave-picture and its determinism also isolations and therefore as such also only in the mind? Sir James goes on to consider "the perceiver and perceived as parts of a single system. In both pictures—he says—the mind fulfils the function of a receptacle, never as an emitter." And he takes a definite realistic stand when he says: "The determinism which appears in the new physics is one of waves, and so, in the ultimate resort, of knowledge. And even this knowledge is one only of probabilities and not of certainties; *it is at best a smeared picture of the clear-cut reality which we believe to lie beneath.* And just because of this, it is impossible to decide whether the determinism of the wave-picture originates in the underlying reality or not. Can our minds change what is happening in reality, or can they only make it look different to us by changing our angle of vision? We do not know, and I do not see how we can ever find out; my own opinion is that the problem of *free will* will continue to provide material for fruitless discussions until the end of eternity." In other words Sir James has discovered that his attempt to prove free will in his book "The Mysterious Universe" from the indeterminism he had previously favoured was a futile one. However, reasoning by analogy from the all-pervading electron of Heisenberg that the perceiving mind is of the same nature as the object perceived, he inevitably lands into the pantheistic phantasy that we may be but "ingredients of a continuous stream of life", and he obviously suggests that the intellect is all-pervading, and it is only the intensities of the intellect-waves that show themselves as individual intellects, which by abstract consideration in space and time would appear to have individual existences. This is his answer to the "fundamental difficulty which confronts every form of philosophical idealism. If the nature we study consists so largely of our own mental constructs, why do our many minds all construct one and the same nature?" Would it not appear that Sir James tells a parable and then himself "makes the fundamental mistake of failing to distinguish between the half-truth of parable and the literal truth?" Again if he were

a thorough-going idealist he would be an " illusionist ", and such a question would not be a real difficulty for him. It seems to us, however, that the answer to the question is to be found in the doctrine of universals as outlined above. Our minds all construct one and the same nature, because, firstly, one and the same nature is the basis of all the activities of our several intellects, and, secondly, because our intellects must all be modelled on the same plan. " To his own image and likeness He made man ". It is not that we " believe " or *assume* a reality to underly our mental pictures. We do " experience " the reality and the experience is by way of intellection.

The writer has had great difficulty in presenting his ideas, not only because he has had to marshal them in a new manner for himself, but also because he writes for the general reader who is supposed to be neither deeply versed in philosophy nor specialised in any of the sciences. He hopes, however, that he has set some minds thinking which are more capable than his own to enter into these discussions and to make abstruse discussions more intelligible to the ordinary reader. For all his deficiencies he craves indulgence.

# LAND REVENUE ADMINISTRATION UNDER HAIDER ALI (1760-82)

By

B. NATARAJAN, M.A.

## 1. MODERNISATION OF LAND REVENUE SYSTEM.

Haider's fiscal system was based mainly on the Hindu system that existed previously. But, in that time-honoured system, he introduced certain changes which had far-reaching results both on the administration of land revenue and on the economic condition of the peasants.

The fundamental change effected by him in the system of land revenue administration was the introduction of money assessments. The ancient custom of sharing the produce between the cultivator and the Government was disturbed. Even wet lands were assessed in money calculated in Viraroya fanams.[1] This innovation was an improvement on the *varam* or sharing system; it rendered collections easy and gave fewer opportunities for peculation and fraud; but it also entailed many hardships on the ryots.

Firstly, the ryots were less able to bear bad seasons. Secondly, as *kistbandi* (the demand for revenue) followed closely the harvests, the ryots had to sell their produce immediately. This created a glut in the market and prices of produce fell. The years 1776-7 to 1780-1 saw the nadir of this depression, as is seen from the table below:

Agriculture ceased to be a paying proposition for those who did not work with the sweat of their brow. Absentee landlords were hard hit. They "were reduced to poverty", and had to give up their lands. Land went into the hands of actual cultivators. This phenomenon of transference of valuable property from one class to another was observed by Buchanan when he toured through Haidar's dominion. He writes, "Many of the old farmers, who were mostly Brahmins ran away, and the ground was forced upon

1. Buchanan: A journey from Madras through the countries of Mysore, Canara and Malabar (1807), Vol. II; Chap. IX. P. 228-31,

*Table showing the prices of food-grains in Haidar's dominion (Baramahal) from 1773-74 to 1781-82 (the year of his death)* *

| Years. | Price per candy of Bajra, dry grain. | | | Index No. | Price per candy of Paddy, wet grain. | | | Index No. |
|---|---|---|---|---|---|---|---|---|
| | Pagoda. | Fanams. | Annas. | | Pagoda. | Fanams. | Annas. | |
| 1773-74 | 1 | 5 | 0 | 100 | 2 | 0 | 0 | 100 |
| 1774-75 | 1 | 3 | 0 | 87 | 1 | 6 | 0 | 80 |
| 1775-76 | 1 | 2 | 0 | 80 | 1 | 3 | 0 | 65 |
| 1776-77 | 0 | 8 | 0 | 53 | 1 | 0 | 0 | 50 |
| 1777-78 | 0 | 6 | 0 | 40 | 0 | 7 | 0 | 35 |
| 1778-79 | 0 | 4 | 0 | 27 | 0 | 7 | 0 | 35 |
| 1779-80 | 0 | 6 | 0 | 40 | 0 | 7 | 0 | 35 |
| 1780-81 | 1 | 2 | 0 | 80 | 1 | 0 | 0 | 50 |
| 1781-82 | 2 | 0 | 0 | 133 | 1 | 5 | 0 | 75 |

* Compiled from Baramahal Records, Sec. VI.
16 Annas = 1 Fanam.
10 Fanams = 1 Kantarai pagoda.

those who remained and the Sudras who had formerly been chiefly employed in cultivating dry fields ".[2]

The economic effects of such a transference of landed property from a class of absentee landlords to a hardworking peasantry were far-reaching. The latter were till then cultivating mainly dry lands. They were therefore a hardy set of men and when the wet lands which require less labour fell into their hands, they put all their industry into the newly acquired property. And under the added pressure of a higher tax imposed by Haidar's son Tippu Sultan, these new class of landowners had to grow two blades of grass where only one grew before. Striking improvements in the technique of cultivation and yield of land followed. " They were compelled to betake themselves to greater industry than formerly was practised. They have given up the sprout-seed cultivation, which required little trouble; and except on a small quantity of poor low-rented land, have adopted the more laborious culture by

2. Ibid., p. 201.

transplantation owing to which the produce of the land has been almost doubled. Those farmers who still cultivate nothing but dry fields allege that they are worse off than those who have taken rice-grounds ".[3] This is borne out by the table below:

*Table showing the relative effects of the introduction of money assessments by Haider Ali on the dry and wet lands in Baramahal between the years* 1773-4 *to* 1780-81.

| Years. | Dry. Percent of the Gross Produce. | | Wet. Percent of the Gross Produce. | |
|---|---|---|---|---|
| | *Surplus.* | *Deficit.* | *Surplus.* | *Deficit.* |
| 1773-74 | 5·5 | | 35·7 | |
| 1774-75 | | 1·3 | 25 | |
| 1775-76 | | 5·5 | 11 | |
| 1776-77 | | | 13·75 | |
| 1777-78 | | 2·0 | 3·5 | |
| 1778-79 | | 116·6 | | 16·3 |
| 1779-80 | | 222·2 | | 80·0 |
| 1780-81 | | 5·5 | | 15·7 |

Thus, we find that, after deducting the land revenue and the ryot's share for maintenance from the gross produce, the ryots of the dry lands were faced with heavier and continued deficits.

The commutation of the share of the State into money had its effects on garden lands also. In the sharing system the assessments, at least on valuable crops such as sugar-cane, tobacco, turmeric, etc., varied with the nature of the crop. Garden lands produced two crops annually of valuable produce; hence the Government share, which was supposed to be 40% of the gross produce, was commuted into about four times the assessment on dry land. This was a great hardship and amounted to taxing capital improvements, because in the case of garden lands the increase

3. Ibid., p. 228-31.

of yield was due mainly to the ryot's labour and capital sunk in digging a well.[4]

The second important change introduced by Haider was to abolish the practice of paying revenue officials by means of a share from the produce of land and to institute in its place a direct payment in cash. The office of Deshmuk or "Zemindar" was abolished by Haider, and officers, paid regular salaries, were appointed in their stead. The Deshmuks formerly received a payment of 10% of the net yield on every field. By the reform effected by Haider, this amount was added to the coffers of the State. Buchanan adds "that it was but fair that government should receive this perquisite".[5]

These two reforms may be termed, the "modernisation" of the land revenue system by Haider Ali. The East India Company, in the beginning of the 19th century, found these very measures to be the *sine qua non* of a good system of land revenue administration. The history of the land revenue administration in the Madras Presidency, in the first quarter of that century, was largely a series of struggles on the Company's part to establish a fixed money rent in the place of a variable *varam.* [6]

## 2. Reform of the Administrative Machinery.

Haider also effected other reforms on the administrative side of land revenue system. In Haider's administration the district revenue officer was known as *amildar.* He exercised mixed functions. He was both a collector and a contractor of revenue. An amil, for example, agreed to give for a district a fixed sum on the condition that a loss or gain, not exceeding 10% was his own; if either exceeded that sum, the difference was borne or received by the Government. This was not a new principle of Haider. It was introduced by his predecessor on the Mysore throne, Chicka Deva Roya and continued by his successors with modifications and exceptions.[6a]

In certain parts of his dominion Haider resorted to other methods for collecting land revenue. Necessity seemed to

4. Nicholson: Manual of the Coimbatore Districts (1887) Chap. V. P. 108.

5. Buchanan: op. cit. PP. 298-300.

6. P. J. Thomas and B. Natarajan, *Economic Depression in the Madras Presidency*, 1820-55, Madras University Journal, Vol. VI-No. 2.

6a. Wilks: History of Mysore, Vol. I. P. 412.

have driven him to mortgage the revenues of whole districts to Sowcars for immediate cash payment. The ryots were bound over to these Sowcars for their land revenue "with a premium of 3%, 3 more for deficiencies in light money and 2% interest per month on the proposal; which came to 8% for the first month, 12 for three, 18 for six and 30 for twelve. Thus a great portion of the produce was monopolised by the Sowcars".[7]

Dictated by political exigencies, this was the turn that the system of land revenue administration took in the days of Haider. And with such a system there were frequent cases of fraud, defalcation and consequent oppression to ryots and loss to Government. But Haider was equal to the task. One of his first acts of reform was to amalgamate the departments of Revenue and Police and to appoint as *Shamia* (Head of Police) a Brahmin "possessing all the cool acuteness necessary for giving efficiency to Haider's plans and unfettered by any scruples or compunctions that might obstruct their operation".[8] This officer instituted a special commission for the investigation of embezzlements; and the commission was greatly successful in the detection of frauds.

Besides this special commission for detection of frauds, he had other ways of checking abuses. "He was accessible to all".[9] "He protected the cultivator".[10] In all departments, "territorial and fiscal, present or absent, he maintained two Brahmins, a newswriter and a secret writer for every taluk. They were known as Hurkaras; each of whom without being acquainted with the others acquired a knowledge of every action of his servants good or bad".[11] It was also their duty to hear all complaints, and to report them to the officer of the revenue department. They were also bound to report on all waste lands. This system proved a great check on oppression and defalcation by revenue underlings.[12] Haider himself was a firm believer in the injunction

7. Letter from Capt. A. Read to the Board of Revenue dated June 1793. q.v. Baramahal Records. Vol. VI. PP. 18-19. Para 56-57. Also letter from Capt. A. Read to Marquis Cornwallis dated 1st July, 1793. q. v. Ibid. P. 54. Para 80, Annex to paper (II).

8. Wilks: op. cit. Vol. I. P. 398. *n.*

9. Fullarton: View of the English Interests in India (1788) P. 64.

10. Buchanan: op. cit. Vol. II.

11. Kirmanee: Neshani Hydauri: Trans. by W. Miles (1847) P. 476.

12. Buchanan: op. cit. Vol. II. P. 91.

of the Koran, which commanded "Go walk forth in the earth". And so, secretly and covered with a *gileem* or blanket, he often went out into the streets and lanes of a city, to ascertain the condition of the inhabitants, the poor and strangers; in fact, he considered that the success of his measures depended on his continual movements about the country.[13] "The minutest circumstance of detail," says Col. Fullarton, "the produce of a crop, the cultivation of a district, the portion paid to the Sircar, and that reserved to the inhabitants, were accurately known to him: not a movement in the remotest corner could escape him, not a murmur or intention of his neighbours but flew to him. It will hardly appear exaggeration to say, that he was acquainted with every spot and almost with every person in his empire, when we consider that he was in a continued round of inspection".[14]

He had recourse to other methods of checking the oppression of his revenue officers. Often he summoned them all in person to the capital for the purpose of adjusting their past accounts and future revenues. And on such occasions he exhibited acts of great liberality in rewarding those who discharged their duties properly and honestly, and acts of most ferocious cruelty in punishing those who were delinquent and negligent. "He placed all offices of responsibility in the hands of wise and honourable persons. He was the enemy of the indolent and luxurious; and the backs and sides of his negligent and extortionate servants were frequently softened by stripes of the whip".[15] Against negligence or malversation he was inexorable. That was the secret of the high standard of efficiency of Haider's administration. "The officers of the revenue fulfilled their duty with fear and trembling; the slightest defalcation was punished with *chaubuck* or with death".[16]

Rev. Swartz, a Lutheran missionary who was sent as an envoy to Haider's court by the Governor of Fort Saint George, personally witnessed some of the cruel punishments meted out to the revenue servants who did not discharge their duties properly. Two hundred people with whips stood always ready to strike. Haider was impartial in his justice. He did not distinguish between masters and servants, foes and friends, sons and relations. Swartz, in a letter to a friend, writes: "Once of an evening, I went into

13. Kirmanee: op. cit.
14. Fullarton: op. cit. P. 63.
15. Kirmanee: op. cit. P. 476.
16. Fullarton: op. cit. P. 62.

the palace and saw a number of men of rank sitting round about; their faces betrayed a conscious terror. Haider's Persian Secretary told me, they were Collectors of districts. To me they appeared as criminals expecting death. But few could give a satisfactory account; consequently the most dreadful punishments were daily inflicted. I hardly know whether I shall mention how one of those gentlemen was punished. Many who read it, may think the account exaggerated, but the man was tied up; two men came with whips and cut him dreadfully, with sharp nails was his flesh torn asunder and then scourged afresh; his shrieks rent the air".[17]

This is corroborated by indigenous evidence. Mirza Ikbal, the author of a Persian work entitled *Ahwali Hyder Naik,* writes: "If he (Haider) confided to any one the charge of a district, God protect him if he took to the value of a blade of grass besides the dues assigned to him by Haider! He was sure to be flayed alive. Whenever information arrived that so much money was due from the farmer of revenue, he first sent for him and demanded the money and if it was not paid, he prepared to compel him by oppressive and cruel means".[18]

Torture, as a means of extracting the legitimate dues of the State, was a very ancient institution in India and it was prevalent in the Madras Presidency till about 1855, when a commission was appointed to investigate into the practice; Haider employed it on the delinquent servants of the State, so that it might serve as a public warning.

With this end in view, he never dismissed such servants after punishing them openly. "When he has inflicted such a public scourging upon the greatest gentlemen, he does not dismiss them. No! they remain in the same office and bear the marks of stripes on their backs, as public warnings".[19] The Persian work referred to says that torture was practised on the corrupt officials, only so long as they refused to pay the legitimate dues of the Sarkar. But the moment they paid them, Haider's rage was softened and he presented them with shawls and golden chains, and again offered the same office to the poor men who had just escaped from death.[20]

17. Letters written to one of His Majesty's Chaplains and another Friend in 1779 and 80; q.v. Wilks, op. cit. Vol. I. App. VIII. P. 523.

18. Mirza Ikbal: Ahwali Hydur Naik. Trans. by Col. W. Miles (1842). Printed as supplementary note to Kirmanee's Neshani Hydauri. P. 502.

19. Letter from Rev. Swartz, op. cit. P. 525.

20. Mirza Ikbal: op. cit.

Munro also writes, " He stripped them of their money, gave them a small present, and sent them to another district to renew the same operations ".[20a] Another account, however, relates that under Haider's administration, a man that had been removed from his place, after proof of neglect or maladministration of his duties to government, or of extortion, extravagance or oppression of God's people, and whose delinquencies were attested by official persons, was never restored to office.[21] Wilks also recorded that it led to dismissal of officers.[22]

Thus the free access that the people had to Haider and the fear of torture kindled in the breasts of revenue officials acted as restraining influences on the otherwise unlimited oppression on ryots. Wilks says, " The collectors or contractors of revenue were tolerably well aware that the surplus demand would fall little short of the sums which they had irregularly exacted or falsified in the accounts. He was at all times accessible to complaints and never failed to pursue to its source the history of an irregular demand and to recover it with additional fines from the exactor. It is true that the amount was never returned to the complainant, but it frequently produced the dismission of the offender; the certainty of investigation tended to restrain oppression ".[23]

But Wilks is of opinion that Haider deliberately allowed his revenue officials a free hand in the first instance and punished them later, because it was a part of his system to squeeze the sponges that absorbed the people's wealth.[24] In another place, he records that Haider was accustomed to say that rapacity of revenue officials was nearly as good for his subjects and much better for himself than a more scrupulous distribution of justice.[25] He also cites instances of a series of finance ministers who were forced to disgorge even the fortune which they honourably made in his service.[26]

There is, however, a different version of his conduct towards the revenue officials in the Persian work *Ahwali Hydur Naik.* It

20a. Letter to Capt. Allen 8-6-1794 q. v. Gleig Life of Sir Thomas Munro (1830), Vol. III, P. 97.

21. Kirmanee: op. cit. P. 476.
22. Wilks. op. cit. Vol. I. P. 399.
23. Ibid., Vol. I. P. 399.
24. Wilks: South of India (1810). Vol. I. PP. 126-33.
25. Wilks: op. cit. Vol. I.
26. Ibid. PP. 412-14.

says that if ever Haider kept his faith with any one, it was with two classes of people, *viz.*, his revenue officials and merchants. "He was very steadfast in his word to his Talookdars. If any of his revenue agents farmed a district from him, although he strove to raise the amount to be paid as high as possible, yet if any profit was derived beyond the Government money, he never took more than the precise sum stipulated; indeed many persons have offered him the surplus; but he in reply said 'If the amount contracted with the Government had been short, I should have exacted the deficiency; and therefore, if the farmer gets more, I have no right to interfere between him and his good fortune'".[27] Neither does Swartz who had opportunities of observing things first hand in the court of Haider mention anywhere that Haider plundered his subordinates unjustly. But he observes that it was Haider's view that almost all government servants who seek to enrich themselves are devoid of all principles of honour.[28]

But in spite of these dreadful checks and unusual vigilance on the part of Haider, corruption and oppression could not be wholly stamped out. There appears to have existed a scramble for revenue jobs and people seemed to have outbid one another with the result that they had to impose heavy burdens on the tax-payers. Swartz says, "The Brahmins are by far the worst in this traffic. When they have obtained a district, they flay the people with unrebutting and inhuman cruelty and with the most philosophical *sang froid.* At last, they pretend to be poor, receive Haider's chastisement and return to their district.[29] However, there is little doubt that the corruption which prevailed in the Mysorean land revenue administration in the 18th century is often very much exaggerated.

### 3. Incidence of Land Revenue.

Regarding the incidence of land revenue under Haider, there are conflicting opinions. Earlier writers like Buchanan state that it was moderate. He writes: "My informant does not think that the land-tax under that judicious prince was by any means exhorbitant."[30] In another context he notes, "Indeed, most of Haider's operations in finance seem to have been highly judicious and reason-

27. Mirza Ikbal: op. cit.
28. Letter from Rev. Swartz, PP. 525-6.
29. Ibid., PP. 525-26
30. Buchanan: op. cit. Vol. II. Chap. IX. PP. 201-12.

able; and on account of his justice, wisdom and moderation, his memory is greatly respected by the natives of all description".[31] From the widely divergent yield of fields, fertility and seasons, no exact calculation can be formed of the proportion which land revenue bore to the gross produce under Haider. In an instance referred to by Buchanan, we find that it was about 47% of the gross produce. But it differed with the sources of irrigation available for the land. In the case of fields irrigated by water from a reservoir, the share of the ryot was one half. If it was entirely by well-cultivation then it was $\frac{2}{3}$. If the water was from a river channel, he got $\frac{5}{9}$. If it was partly by tank water and partly by well irrigation then it was $\frac{3}{5}$.[32] Even in the richest soil on which three crops were raised every year, it was hardly known that the cultivator ever got anything less than 40% of the crop.[33] In the face of these unbiassed evidences such statements as that Haider ruined the people[34] by his excessive assessments and that they were so high that only his skill enabled him to realize them are but passionate exaggerations.[35] When the incidence of land revenue in the individual districts are studied in detail it will be seen that whatever might have been the defects of Haider's land revenue administration, excessive assessment was certainly not one of them. All that he did was to intercept the profits of the middlemen like the renters and the exactions of revenue officials and added them to the exchequer of the State. "He left the fiscal institutions of Chick Deo Raj as he found them, adding however to the established revenue whatever had been secretly levied by a skilful or popular Amil and afterwards detected. This produced a progressive and regular increase and the result of complaints gave occasional, but also tolerably regular augmentations".[36] And when he died, he left behind him, "a country extending 400 miles in length from north to south and 300 miles in breadth, from east to west, with a population of many millions, an army of 3,00,000 men and £5,000,000 of annual revenue".[37] Although Haider was constantly engaged in war, the improvement of his country and the maintenance of a

31. Ibid., Vol. I. PP. 298-300.
32. Ibid., PP. 387-89.
33. Fullarton: op. cit. P. 247.
34. Munro: Letter from Canara dated 31st May 1800.
35. Nicholson: op. cit. PP. 93-95.
36. Wilks: op. cit. Vol. I. P. 399.
37. Fullarton: op. cit. P. 247.

strict administration formed the constant object of his care during the years 1769 to 1780, the period of peace with the English.

The result was that " under his masterly control they attained a perfection, never heard of under any other Indian Sovereign, the husbandman, the manufacturer and merchant prospered in every part of his dominions ; cultivation increased, new manufactures were established, and wealth flowed into the kingdom." [38] Thus ran the verdict of an English commander of the Southern Army on the Coromandel coast and a member of Parliament, as a result of personal observation, unbiassed by prejudice or partiality.[39]

38. Ibid., P. 62.
39. Ibid. P. IV.

# KŌPPERUNJIÑGA—HIS LIFE AND TIMES

*Sankara Parvati Prize Thesis*—1931.

By

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*(Continued from p. 322 of Vol. IX, No. 3, of this Journal.)*

## *Relations with the Hoysalas.*

The part played by the Hoysalas in the restoration of Rājarāja III has already been described. Even after his assumption of the crown, he had no end of troubles. About 1237 the Hoysala Vīra Sōmēśvara, son of Narasimha, seems to have established himself at Kaṇṇanūr Kōppam.[21]

Either the Hoysalas attempted again to check the growth of the power of Kōpperunjiñga or that Kōpperunjiñga was on the offensive, and tried to dislodge them from their secondary southern capital Kaṇṇanūr Kōppam—near Śrīrangam. Perhaps it is this victory of Kōpperunjiñga that is referred to in his Vrddhācalam inscription of the 10th regnal year.[22] This inscription refers to the gift of a gold forehead plate set up with jewels to Tirumudukuṇramuḍaiya Nāyanār by Avani Āḷappirandān alias Kōpperunjiñga dēva of Kūḍal in expiation of the sin for having killed a number of Daṇḍanāyakas of the Hoysala king viz., Kesava, Harihara and

21. E. C. V.—Introduction—Lewis Rice, p. XXV, Ak. 123 = 1237 A.D. This year Sōmeśvara was engaged in a victorious expedition over Kāḍavarāja and encamped at the Kōppa of Mangala.

22. 73 of 1918—Extract from the text— " திருமுனைப்பாடி கீழாமூர் நாட்டுக் கூடல் அவனி ஆளப் பிறந்தானை கோப்பெருஞ் சிங்கன் பெரும்பலூரில் போசளனர் தண்டநாயகம் செய்வார்களில்......கேசவனும், ஹரிஹர தண்டநாயகனும்......தேவனும் உள்ளிட்ட தண்டநாயகஞ் செய்வார்களை உயுத்தக்களத்திலே......இவர்கள் பெண்டிர் பண்டார முள்படக்கவர்ந்து கொண்ட இதுக்கு பிராயச்சித்தமாக இந்த நாயனர் திருமேனியில் சாத்தி அருள அவனி ஆளப்பிறந்தான் என்னும் திருநாமத்தால்

चारुरत्नमयं पट्टमवन्यवन संभवः ।
त्रिदशीशाय श्रीवृद्धगिरिवासिने ॥

இப்படியால் சாத்தி அருளின திருப்பட்ட கல் செய்தமுகம் 3 ல்"

others at Perumbalūr and of having seized by force their ladies and treasure. The ornament itself was called '*Avani Āḷappirandān*' and it was placed on the image of the Lord with the chanting of a verse found in the text of the inscription.

The advance of the Hoysalas in the region of Vrddhācalam is further testified by a gift of 210 cows made by the Hoysala general Harihara Daṇḍanāyaka to the presiding deity at Vrddhācalam sometime in the reign of Kōpperunjiñga.[23]

If the Kannaḍiyas refer to the Hoysalas, it is pertinent to mention here a reference in an inscription found at Tiruveṇkāḍu (Tanjore district) belonging to the 33rd year of Śrī Vallabha (Pāṇḍya king) that up to the 33rd year of the (Pāṇḍya) king commencing from the time when Kōpperunjiñga was fighting against the Kannaḍiyas who were building fortresses on the north bank of the Kaveri, the festivals of the temple were not conducted and were then (in Śrī Vallabha's days) ordered to be resumed. From this it is possible to infer that the Hoysala menace was on a wider field and of a serious character for a time at least, but gradually they were subdued and driven out of the region of his effective sway.[24]

In spite of the victory of Kōpperunjiñga, claimed in his Vrddhācalam inscription the Hoysalas are still found about 1258 A.D. at Kaṇṇanūr Kōppam, but it seems reasonable to hold that they were not any longer by then a serious menace to Kōpperunjiñga.

*Relations with the Telugu-Cōḍas and the Kākatīyas.*

The advance of the Kākatīya king Gaṇapati into the south is to be inferred from his inscription in the Ēkāmbaranātha temple at Kāñcipuram. It is dated Śaka 1172, 8th June 1249, A.D. and mentions the gift of the village of Kulatūr to the temple of Ēkāmbaranātha by Samanta Bhōja, the minister and general of Gaṇapati—perhaps also the Governor of Kāñci[25]

Between 1250 and 1258 the power of Kōpperunjiñga should have been checked by Jaṭāvarman Sundara Pāṇḍya I and this will be discussed in due place. Finding perhaps no chance of extension

23. See Topographical List, Vol. I. No. 1093—South Arcot District.
24. 514 of 1918.
25. See 26 of 1890—I.A. XXI p. 197 f.

of his power in the south against the powerful Pāṇḍya Emperor, the Pallava should have tried his fortunes in the north, and might have subdued the Telegu-Cōḍas including Vijaya Gaṇḍa Gōpala of Kāñci. His earliest inscription found in Kāñcipuram is in his 11th year.[26]—1254-5 A.D. Here are found also his inscriptions of his 15th, 18th, 19th and 20th regnal years. His Drākṣārāma record is dated Śāka 1184 = 1262 A.D. It is therefore likely that his war against the Kākatīyas should be assigned to the period between 1255 and 1262 A.D. In this war against the Kākatīyas, there is a great probability that Kōpperunjiñga's son might have played a distinguished part. The Tiruvaṇṇāmalai record in verse-form (480 of 02) records various gifts made to the God of Tiruvaṇṇāmalai by Kōpperunjiñga and his son called " Kāḍava Kumaran ". The latter is said to be Lord of Mallai (= Māmallapuram), Mayilai (= Mylapore), Kāñci, Taṇḍaha nāḍu (= Toṇḍaimaāḍalam strictly Taṇḍakāraṇyam) and the Lord of the region of the Peṉṉai-; and that he caused both the Karunātars of the west—(the Hoysalas)—and the Telungars—(the Kākatīyas)—to perish.

On the other hand, the Drakṣārāma record (419 c. of 1893), which is very defective, seems to imply that Kōpperunjiñga acknowledged the supremacy of the Kākatiīya king Gaṇapati. He assumes the title of ' Son of the Kākatīya—*Kākatipatehe Sutēna* ' a term of endearment implying a feudatory general and further records that he carried out the orders of Gaṇapati Mahārāja— " Gaṇapati Mahārājasājñam pravartiyatā ". From this we have to infer that the northern advance of the Pallava chief was checked by Gaṇapati.

There is further reference to a Kāḍavarāya having been worsted in a struggle by Ambadēva Mahārāja who for a time usurped the Kākatīya dominion between the rule of Rudrāmma and her grandson Pratāparudra. The earliest dated record of Ambadēva seems to be 168 of 1905 in Śāka 1194 which is equal to 1272-3 A.D. In that case he could not have been Gaṇapati's general, though it is quite likely that he met and defeated Kōpperunjiñga, because in another inscription dated Śāka 1213 = about 1291 A.D. (No. 173 of 05), Ambadēva claims among other things to have worsted the Kāḍavarāya '. It is therefore very likely that Ambadēva's victory was a later and different event. It appears Kōpperunjiñga was defeated more than once by the Telungars—the Kākatīyas. The expression ' Kāḍavarāya Vimardhakaha ' need not be taken in the

26. Nos. 353 and 450 of 1919.

sense that Ambadēva destroyed the Kāḍava, but may be that he was worsted in the struggle by the former.

*Relations with the Pāṇḍyas.*

The first Pāṇḍyan invasion of the Cōḷa country under Māravarman Sundara Pāṇḍya I, the attempt of the Cōḷa Emperor Rājarāja III to assert his independence, the second invasion of Māravarman Sundara Pāṇḍya, the accession of Rājēndra III and his effort to regain the lost greatness of the Empire have been already described. With the accession to the throne of Madura in 1251 A.D. by Jaṭāvarman Sundara Pāṇḍya I, there was a vigorous policy of expansion. In his inscriptions of the 7th year—i.e. before 1258 A.D., Sundara claims victory over the Pōśala Kings (the Hoysalas) and the capture of Kaṇṇanūr Kōppam. Then he began his campaign against Kōpperunjiñga. Says the *praśasti*:

" வருதிறை மறுத்தங்கவனைப் பிடித்துக்
கருமுகில் நிகளங் காலிற் கோத்து,
வேந்தர் கண்டறியா விறற்றிண் புரிசைச்
சேந்தமங்கலச் செழும் பதிமுற்றிப்
பல்லவனடுங்கப் பலபோராடி
நெல்விளைநாடு நெடும்பெரும் பொன்னும்
பருமையானையும் பரியுமுதலிய
வரசுரிமை கைக்கொண்ட வற்களித்துத்
தில்லையம்பலத்துத் திருநடம்பயிலும்
தொல்லையிறைவர் துணைக்கழல் வழ(ண?)ங்கி"

The tribute sent by the Pallava was rejected. He was put in chains. Many fierce campaigns were conducted round his capital, so as to strike terror in the heart of the Pallava and after the capture of his capital, his country, his treasures, elephants, horses and other insignia of royalty, he was restored (to his freedom and his territory) by the Pāṇḍya. The victory of Sundara Pāṇḍya is also referred to in an inscription at Chidambaram—2 verses in the east gopuram (332/13). One of the two verses is given below:

"பண்பட்ட மென்மொழிப் பைந்தொடி கொங்கை பரக்கவைவேற்
கண்பட்ட முத்த வடங்கண்டு காக்கிலன் காடவர் கோன்
எண்பட்ட சேனை யெதிர்பட்டொழுக வெழுந்த புண்ணீர்
விண்பட் டலையப் படைதொட்ட சுந்தர மீனவனே."[27]

27. See also inscriptions of 'அனைத்துலகுங் கொண்டருளிய' Jaṭāvarman Sundara Pāṇḍya's 6th and 7thyear at Cidambaram:
330 of 13—6th year—Jaṭāvarman alias Jaṭāvarman Sundara Pāṇḍya.
289 of 13—7th year—252nd day.

Sundara Pāṇḍya presented to Śrīranganātha a garland of emeralds seized from the Kaṭāka (i.e. Kādava) king Kōpperunjiṅga. This was a crushing blow to Kōpperunjiṅga. We have stated already that it was after this event, he tried his fortunes in the north. But in spite of his victorious northern campaign he is found in 1267 A.D., coming to Cidambaram to pay tribute to Jaṭāvarman Vīra Pāṇḍya —a co-regent (or sub-king) of Jaṭāvarman Sundara Pāṇḍya I. The latter seems to have reigned till about 1269-'70 A.D., and to have extended his empire as far at least as Nellore where he is said to have performed 'Vīrābhiṣēka'. It is very likely that Kōpperunjiṅga should have remained a tributary prince till at least the end of the reign of this powerful emperor (c. 1269-70 A.D.) or he might have played fast and loose avowing his loyalty and paying tribute whenever occasion demanded.

*Kōpperunjiṅga as a general and warrior.*

In spite of some exaggeration, the boast of his victories over the Cōḷa, Karnāṭa, Pāṇḍya, and Āndhra kings has been found, from the foregoing, to be based on facts. In the Tripurāntakam and Drākṣārama records, he claims to have destroyed 'the pride of the Karnāṭa king" to be the 'sun to the lotus tank of the Cōḷa family' and 'the architect in establishing the Pāṇḍya king'. He assumes the title of "Mallaivēndan" and the "Conqueror of Śōnāḍu". The titles of (Sarvajña)-Khaḍgamalla (the peerless swordsman) Vāḷvallaperumāḷ, Niśśankamalla denote his strength and heroism.

The extent of the dominions over which he held sway is expressed by the expression 'Kshīrapāgadakṣiṇa Nāyaka' (Lord of the region south of the Pālār ?), Pennānadinātha (Lord of the region of the Peṇṇār) and Kāveri Kāmukā (Lover of the Kāveri river or the country watered by it).

By his arm and by his ability as a general, he won a vast territory under his control, and made himself master of the whole of the Toṇḍaimaṇḍalam—though his influence might have spread north and south a little beyond this region.

*His Religion and Religious Benefactions.*

Kōpperunjiṅga was a very deeply religious man. He seems to have been an ardent devotee of Siva as testified by the title '*Sarva Māheśvareṇa*' of the Drākṣarāma record and his partiality for the deity of Naṭarāja at Cidambaram is well known by the title "*Kanakasabhāpati-Sabha-Sarvakārya-Sarvakāla Nirvāhakah*," assumed by him according to the Āttūr record. The Tripurān-

takam inscription says that Mahārājasimha (i.e., Kōpperunjiñga) " built the eastern gopuram of the Chidambaram temple resembling Mount Mēru out of the riches obtained by the conquest of the country of the Kāveri and called the gopura by his name " and he is said to have *decorated the four sides* of it with 'the booty acquired by subduing the four quarters.'

" The illustrious King Khaḍgamalla, the steps of whose fame were swift enough in the art of jumping across the waves of the seven oceans, built for Śambhu the primeval Dancer who bestows prosperity on the seven worlds, a (seven-storied) tower whose pinnacles had at its base the wavy (?) circle of stars, from the wealth which he had got by the conquest of the seven islands (of the earth).

He, the Kathaka King born to rule the Earth, the repository of all virtues, made the *tower* of the Assembly Hall of the Lord of Dancers filled with all Gods having brought thither by (the force of) his highly pure and magnificient fame the seven worlds to appear before the eyes of the people in the guise of (its) seven stories.

Having defeated the Kings of the *east* and having performed with the hordes of their wealth the *tulārōhaṇa,* (this) King Niśśankamalla, with the large quantities of gold, offered by the enemy (—kings) as tribute, made the eastern face of the tower in the Hall of the moon-crested (Siva) ever engrossed in dancing in the presence of the Daughter of the Mountain, rival (the globe of) the sun which had stood against it (in the east).

(This) Lord of the Kings of these three worlds caused the terrified Cōḷa (King) on the *south* to take (i.e., escape by) the boat; after ascending the scales with his wealth, built with this the southern part of the tower of Hara, i.e., Siva.

Kripaṇamalla (i.e., Khaḍgamalla) crushed the *Karnāṭaka* King in the *western* quarter performed (the ceremony of) ascending the scales with his wealth and built with this the *western* part of the tower of Hara (i.e., Śiva).

The hero, the illustrious King Khaḍgamalla effectively defeated in the *north* the *Āndhra* kings with his armies, ascended the (royal) scales with the wealth sent by them as tribute and with the gold made the *northern* face of the glorious tower of the prosperous Lord of the Little Hall (shrine) like a sheet of lightning.

The glorious Mahārājasimha of unparalleled prosperity verily consecrated with crowns (this) tower (gōpura) in the Hall of Lord (Śiva) to the sole overlordship of the *gōpuras,* having made the golden pots (for the ceremony) with the crowns of (enemy) kings won (by him)."

(Tripurāntakam inscription—
H. Krishna Sastri's translation).

Among the decorations, special mention should be made of the carvings of the various unique dancing postures of the Baratha Nāṭya Sastra. The Āttūr inscription of his 5th regnal year says that he built the southern tower of Tiruccirrambalam Uḍaiyār, at Perumbarrappuliyūr (i.e., Cidambaram) as a gopura of seven storeys. Perhaps Jaṭāvarman Sundara Pāṇḍya I should have caused to be engraved the Pāṇḍyan symbol of the two fish now found over the top and jambs of the southern entrance during his visit to Cidambaram after the Śēndamangalam campaign referred to above as a mark of his acknowledging the Pāṇḍyan supremacy. Various gifts were made and a number of temple buildings are said to have been erected at Tiruvaṇṇāmalai both by Kōpperunjiñga and his son—'*Kāḍava Kumaran.*' The following is a list of the chief works:—

(a) *Gifts of Kōpperunjiñga* to the God at Tiruvaṇṇāmalai:—

A number of jewels, crown, throne, etc., including a *tiruvaśi* called *Avani Āḷappirandān,* another *tiruvaśi* called *Bharatam Valla Perumāḷ* to the Lord of Dance—, articles of dress to the Goddess; He also set up images made of gold of Murugan, his consorts and their vehicle the peacock.

(b) *The gifts and sacred works of the King's son*:—

He built a maṇḍapa called Vēnāḍuḍaiyan (evidently after the surname of the King's son), a bed room for the God. (Paḷḷiyarai), a kitchen, another maṇḍapa called *Avani Āḷappirandār* (king's name)—a *Silaittaḷam* (?) the big treasury called Niśśankamallan (Niccangamallan perum baṇḍhāram), a maṇḍapa called Kāngaeyan; a flower-garden (*Perumāḷ tiruneduñtōppu*), a tank called "*Tūya Tamiḷ nāḍu Kātta Perumāḷ*" (king's name)—the Lord who protected the world of the pure (spotless) Tamil fame, a garden called *Kāḍava Kumāran* (the King's son); another garden called '*Avani-Āḷppirandān,* another garden called *Śenaittalaivan;* a well named '*Perumāḷ' Kiṇaṟu',* a tank called *Kāḍava Kumaran taḍāgam,* a big irrigation tank called *Perumāḷ ēṟi;* a garden called

*Perumāḷ tōppu ;* another called *Vīrarāyan tōppu ;* a tank (irrigation) called Niccangamallan ēṛi—, a *Kangeyan tank,—.'*

He followed the path of virtue and put down alien faiths—(*parasamayangaḷ-tanai-Kaḍinda-āṇaiyar*).

Most of his inscriptions refer to endowments to temples for service, for flower gardens—in Coñjeevaram, Svēta Jambu (Jambukēśvaram), Viraṭṭānam (Tiruvadi ?), Madura, Kāḷahasti, Drākṣārāma, Cidambaram (both the Nataraja and Tillai Amman shrines) Tiruveṇṇainallūr, Shiyali and other places. Provision for the singing of 'Tiruppadiyam' (i.e., Devaram songs) was made at Shiyali.

The western gopuram of the Viṣṇu temple of Tiruvēndipuram was built by an officer of his 'for the merit of Kōpperunjiñga.' (அவனி ஆளப்பிறந்தான் கோப்பெருஞ் சிங்கதேவர் திருமேனிக்கு நன்றாக) Some of his chiefs make grants to Aruḷalāpperumāl at Little Conjeevaram. But we are unable to find any direct royal gift to Vaiṣṇavaite Gods.

*A scholar and a patron of Arts.*

Kōpperunjiñga was a scholar. He is given the surname *Sāhityaratnākara* the ocean of literature. Both Tamil and Sanskrit literatures seem to have been encouraged by the king, as the epigraphs of the period testify. His patronage of Tamil is obvious from the epithets '*Tamil nāḍu Kātta Perumāḷ*' and 'Pēṇu Sentamiḷ Vāḷappiranda Kāḍava.[28]

He was above all a patron of music and of the art of dancing (Nāṭyaśāstra), till recently a neglected and languishing art. From the Tripurāntakam inscription, we learn that he built the Eastern gopuram of the Cidambaram temple and decorated the four sides with the booty obtained by the king from the four quarters. The title of *Bhāratamalla* may refer to his interest in, and encouragement of, Bharatha Nāṭya Śāstra. His Drākṣārāma record gives him the surname '*Nātyākya Vēdāmbudihi*' (the ocean of the art of Dancing or the Nāṭya Śāstra). Perhaps it was he who caused the carvings of images to denote each posture in the inner sides of the eastern tower with the labels of the corresponding text of the Bharatha Nāṭya Śāstra to be engraved below each posture in

28. 480 of '02 and 418 of '22.

grantha characters. Lovers of this art have an invaluable record, which is an enduring monument of his fame.[29]

*An Estimate.*

Āḷappirandān Vīraśēkharan *alias* Kāḍavarāyan of the Vrddhācalam verses the grandfather of Kōpperunjiṅga conquered Kūḍal in Śāka 1108 = 1186 A.D. His son Pallavāndār of the Atti Mōrijonai and *Tirukkaḷukkuṇram* (187 of 1932-3) verses won the battle of Śēvūr and gained Toṇḍaimaṇḍalam. We have already stated that he might be identical with Aḷagiya Śīyan, Aḷagīya Pallavan and Jīja Mahīpati of different records of Kōpperunjiṅga but this identification is not—and cannot—be established beyond possibility of doubt with the evidence on record. The latter's son was the famous Kōpperunjiṅga or Mahārājasimha the subject of this study. We have already proved that the theory of two Kōpperunjiṅgas has been built up on very insufficient data and slippery evidence. He makes his appearance about 1213 A.D. from the mention of him in a record of the 35th year of Kulōttuṅga III. As late as the 14th year of Rājarāja—i.e., 1229 A.D. he was a vassal of the Cōḷa emperor. Then began his revolt—at the time when the Cōḷa empire was hard hit by the Pāṇḍyan aggression. The Cōḷa emperor Rājarāja defeated by the Pāṇḍya—Māravarman Sundara—fell from the frying pan into the fire. The Kāḍava pursued him, defeated him at Teḷḷāru, took him prisoner and confined him at Śēndamangalam. The Hoysala intervention followed. Rājarāja was set free. The Kāḍava was for the time-being humbled. The weakness of the successors of the Māravarman Sundara led to the establishment of Hoysala control over the Cōḷa and Pāṇḍya country. Taking advantage of the confusion in the Cōḷa and Pāṇḍya countries, Kōpperunjiṅga ventured to crown himself king, in 1243 A.D. Three years later Rājarāja III was succeeded by Rājendra III who strove against odds for the re-establishment of the Cōḷa power. Sometime before 1254 the Hoysalas intervened once more (73 of 18—10th year of Kōpperunjiṅga) to check the power of Kōpperun-

29. The Bharata Nāṭya Śāstra enumerates 108 postures, but there are only about 96 in this gopura. The numbers of the verses in the inscriptions follow the order in which the postures are enumerated in the above work. Some are damaged and might have been misplaced. For text see M.E.R. 1914—pp. 74-81 and the plates regarding the postures. See also *Tāṇḍava Lakṣaṇam* by Dr. B. V. Narayanaswami Naidu and others, G. S. Press, Madras. Those on the western gopuram are complete and in order and seem older and better preserved.

jiñga. But the Kāḍava won a decisive victory over them at *Perumbalur* (in the Trichinopoly District) and claims to have killed some Daṇḍanāyakas, Kēsava, Hariharā among them, and to have seized by force their ladies and treasures. In expiation of the sins thereof, he made a present of a jewelled forehead-plate (Cāru ratnamayam paṭṭam) to the God at Vrddhācalam.

The Ākkur record—of doubtful date—229 of 1925—is a record of the activities of a certain Aḷagiya Pallavar *alias* Vīra Pratāpar—who may be most probably Kōpperunjiñga himself or a trusted general of his. It mentions " his pilgrimage to the sacred places in the Cōḷa country south of the Kaveri after his conquest of the south in the course of which he took as prisoners the Hoysalas (Pōśaḷar) and levied tribute from the Pāṇḍyas. It further adds that he was pleased to restore the village, the Kānis and the house-sites (manai) to the inhabitants of the village who on account of certain grievances had migrated and gone as far as the Ganges but were then persuaded to return.

This record should be assigned to this period and we have reason to infer that his sway extended at least over the northern part of the modern Tanjore District. This temporary advantage was soon lost when the Cōḷa country was brought once more under Pāṇḍya sway by the most illustrious Pāṇḍyan ruler of the 2nd Empire—Jaṭāvarman Sundara Pāṇḍya I. The Kāḍava was defeated thoroughly and made to pay tribute. An attempt to defy Pāṇḍya supremacy might have led to the encamping of Vīra Pāṇḍya, his co-regent at Cidambaram to enforce and receive the tribute from the Kāḍava. Meanwhile, in collaboration with the Pāṇḍyas and later on independently, the Kāḍava and his son—' Kāḍava Kumaran ' of the Tiruvaṇṇāmalai record—drove the Teluṅgars to the north. His advance against Gaṇapati upto 1260 A.D. and later against Amba Dēva—the general of Rudrāmma—the successor of Gaṇapati—should have led to protracted wars between the two chiefs in the northern region of the Coromandal Coast and the ' Northern circar ' region. Hemmed in by the Kākatīyas in the north, and the Pāṇḍyas in the south, he should have enjoyed but a brief spell of real political independence. His effective rule should have extended over the modern districts of the northern part of Tanjore, South and North Arcot Districts, and a portion of Cingleput. His reign should have lasted at least 36 years—the latest regnal year of his records. But the outer limit of his reign can be inferred from an inscription (418 of 1909)—from Siddhaliṅgamaḍam—a record of the 13th year of Jaṭāvarman Sundara

Pāṇḍya II (1270-1302) which is equivalent to March 6, 1283 A.D., in which a gift of 2000 Kāśu presented to the temple by one Arindavan Pallavaraiyan in the time of Kōpperunjiñga dēvar was then placed in the hands of the Sivabrahmaṇas of the temple. Therefore the highest limit for the reign of Kōpperunjiñga is sometime before 1283 A.D. And as we have no records of his after the 36th regnal year, it is not unlikely that he died in 1279 or a year or two later than that—and *anyhow before 1283 A.D.* There is not sufficient evidence to prove that he fell by the hand of Ambadēva.

He started as a feudatory—he assumed independence—he defied the greatest kings and generals of his days—and though not always successful, he was able to hold his own against odds. But his success had no permanent gains. If he shattered the Cōḷa power, defied the Hoysala and the Pāṇḍya, he did not leave behind any lasting empire on the ruins of the old. In spite of this limitation, there is something in the achievement that merits our admiration and justifies the name of Mahārājasimha or Kōpperunjiñga—" the Lion among great kings " and the various high-sounding birudas and titles he had to his credit.

## CHAPTER VI

## THE ADMINISTRATION OF THE KINGDOM.

We shall attempt what can be gleaned from his records about the administration of his kingdom.

### *The Central government.*

Kōpperunjiñga's administration may have followed on the lines of the Cōḷas whose country he usurped and ruled over. The king was helped by ministers, who were generals, as well as civil administrators. Some of the ministers were also in charge of small administrative units.

Araśūruḍaiyān Śengaṇivāyan Śōḷakōn *alias* Perumāḷ Pillai, one of the mudalis (general ?) of the king was an important officer of Kōpperunjiñga. He is the author and executor of many gifts to the temples at Cidambaram and Vrddhācalam. The chief gifts made under orders of Śōḷakōn are given below :

(1) *462 of 02*—a flower-garden called '*Āḷiyār tirunandavanam.*'

(2) 465 *of* 02—*Āḷiyār tiruttōppu.*

(3) Gift of cows—85 of 15—Vrddhācalam.

(4) *464 of 02—Perumāḷ Tiruvōḍai*—Cidambaram.

(5) *296 of 13*—Cidambaram—garden—
" Tirunilai—Aḷagiyān tirunandavanam."

(6) Uncopied—8th year—Cidambaram-garden—
" Śōḷakōn tirunandavanam."

(7) *318 of 13*—Cidambaram-garden—
" Avani Āḷappirandān teñgu tirunandavanam."

(8) *83 of 18*—Vrddhācalam—' tiruppaṭṭam '—
'*forehead plate*'.

(9) *326* of *13*—Cidambaram—
" *Sarveśvara Uḍaiya Pillai Tiruppaḷḷi-tāma tirunandavanam* ".

(10) *467 of 02*—Cidambaram-garden—
" *Sokkaccīyan Kamuku tirunandavanam* ".

(11) *468 of 02*—Cidambaram—
" *Śenganivāyan Tirunandavanam* ".

(12) *319 of 13*—Cidambaram
" *Vaḷi-aḍimaikoṇḍān tōppu.*"

(13) " *Śokkaccīyan Kamuku tirunandavanam* ".
uncopied—19th year—Cidambaram.

(14) *460 of 02*—8th year—Cidambaram—
*Śēnganivāyan tirunandavanam.*
*Kannudaiccīyan tiruvōḍai.*
*Tiruttoṇḍar Śīruraitan tirunandavanam.*

An inscription[30] at Cidambaram in the 8th year of the king records a sale of land to Śōḷakōnar for building a temple of Piḍāriyār. Perhaps the present temple of (Mahākāḷi or Tillaiamman) Piḍāriyār should have been built in its present site in the days of Kōpperunjiñga according to an inscription on the walls of the Bhairava shrine in the present Tillaiamman temple.[31]

The main pillars at the west entrance of the 2nd prākāra of the Naṭarāja temple and that at the entrance of the Sivakāmi Amman temple were presented by Śōḷakōn, as attested by inscriptions found thereon. His brother called *Vēṇāḍuḍaiyān* was another

30. 401 of 1903.
31. 312 of '13.

*Mudali* of the king. The Tiruvēndipuram inscription gives his full name :—

"செங்கணிவாயன் சோழகோன் தம்பிபெருமாள் வேணுடையான்"

and he was the builder of the western gopuram of that Viṣṇu temple.[32]

Edirigangayan Pottapi Śōḷan was a chief of "the bodyguard of the king."[33] (Ahammaḍi mudali).

Rājarājadevan Malaiyan Valavarayan was another *Mudali* of the king.[34]

A record from Brahmadēśam[35] refers to a writ of Kaciyarāyan under orders of the king making a gift of land. He is likely to have held a responsible post like a secretary under the king.

Kākku Nāyaka Dēva, son of Madhusūdana dēva, younger brother of Vijaya Gaṇḍagōpāla dēva figures as a donor and should be a vassal of Kōpperunjiñga in the Kāñci-Tiruvannāmalai region,[36]

The following are some of the officers mentioned in his inscriptions :—

505 of 02—2nd year.

(1) Āmūr Nīla Gangaraiyan Avani Āḷappirandān and his son *Āḷagiya cirrambalam Uḍaiyār* alias *Nīlagangaraiyan.*

(2) Āmūr Nīlagangan Ammurikundan Śōḷañga dēvan.

(ஆமூர் நீலகங்கன அம்முரிகுந்தன் சோழங்க தேவன்)

164 of '18—Brahmadēsam.

(3) Pillaiyār Pañcanadivānan *alias* Nīḷagangaraiyan—236 of '21 Āttur.

181 of 1894—Tirukkaḷukkunram—Śōḷinga nācciyār, wife of Pañcanadivānan *alias* Nīlagangaraiyan.

Do. Son—Aruṇagiri Perumāḷ—365 of 1919, Little Coñjeevaram.

*342 of '08.*

(4) Tamiḷ nāḍu kāthan Pallavaraiyar—318 of '13, Cidambaram.

32. 146 of '02.
33. 136 of 1900.
34. 447 of '21.
35. 170 of '18.
36. 487 of '02.

(5) Tirumalai Aḷagiyān *alias* Vīrarvīrappallavaraiyan—497 of '21, Tiruveṇṇainallūr.

(6) *Nāyanār Aḷagiya Śīyarāna Tamil nādu Kāttan Pallavaraiyar* general—302 of '13, Cidambaram.

(7) *Kaḍakan* alias *Nīlagangaraiyan* 350 of 1919—Little Coñjeevaram.

(8) Rājarāja dēvan Malaiyan Valavarayan, one of the *mudalis* of the dēvar. 447 of '21—Tiruveṇṇainallūr.

(9) Nañgai Āḻvar—*queen* (*nampirāṭṭiyār*) of *Avani Āḷappirandān Nīlagangaraiyar* (cf. no. 1) 518 of '02—Tiruvaṇṇāmalai.

(10) 487 of '02—Tiruvaṇṇāmalai—Mention of
(a) *Maturāntaka* (= Madurāntaka) Pottappi Cōḷa Vijaya Gaṇḍagōpala dēvar.
(b) matusūdana dēvar.
(c) Kākku nāyaka dēvar. (*a* and *b* brothers; and *c* is son of *b*.)

(11) Silambaṇindān Kūttāduvān alias *Cēdirāyan* Lord of Paramēśvaramangalam in Śevur Kōttam in Jayañgondacōḷamaṇḍalam. 514 of '02, Tiruvaṇṇāmalai.

(12 *Tennavan Brahmārāyar*—465 of '02, Cidambaram.

(13) *Madurāntaka Viḷupparaiyar*—465 of '02, Cidambaram.

(14) *Śīnattaraiyan*—433 of 1921.

(15) *Toṇḍaimān*—433 of 1921.

(16) *Jayatuñgappallavarayar*—456 of '02, Cidambaram.

(17) Gurukulattaraiyan—285 of '21.

(18) *Villavarājan*—285 of '21.

*Local Government.*

Villages, towns and Nāḍus (which were big administrative units) enjoyed a large measure of self government. The assembly of the village held in common the trust lands and money of the community and they had the right to sell such lands and they also were the inheritors of property of those who had left the village unable to pay the taxes.

Inscription No. 261/1913 refers to a sale of land in the 11th year of Kōpperunjiñga to the temple in a hamlet of Cidambaram and " this sale was witnessed by the Assembly of that village."

440 and 459 of 1921 refer to members of such assemblies making gifts to temples.

*Economic and Social Life.*

The temple played an important role in the life of the people. Gifts, royal and private, were largely made to temples. The temple was not only a centre of spiritual solace but one of learning, and of communal and social activities.

Temple lands were called either *Dēvadāna* lands or Tirunāmattukkāṇi (305 and 307 of 1913).[37] Gifts of lands to temples were made for the following objects:—

*Food oblations.*—(305 and 307/1913, 62/1919).

*Sacred bath of the Gods.*— (395/1918).

Do. *Milk.* (455/21, 459/21, 465/21, 497/21).

Do. *Sandal paste.* (300/1919).

*Saffron.* (396/1903).

*Garlands.* (395/1918).

*Lamps and ghee for lamps.*—(447/21, 448/21, 496/21, 499/21, 500/21, 62/98, 65 and 69 of 1918).

*Bell.* (448/21).

*Silver Kāḷam* (trumpet).—(466/21; 431/21).

*Festivals.* (170/18; 448/21).

*Jewels and ornaments.* (73/18, 80/18, 480/02, 431/21).

*Flower gardens and their maintenance.*—(296, 302, 304 and 318 of 1913, 83/1913, 447/21).

*Provision for a hereditary watchman of the temple.*—69/18.

The capital-endowment for maintaining a lamp was equal to.—

(a) 32 cows and a bull (487 of 02, 514 of 02, 316 of 21, 70 of 03, 465 of '21),

(b) 96 sheep (365 of 1919).

37. The distinction between Dēvadāna lands and Tirunāmattukkāṇi is not very clear. Perhaps the former might be gifts to temples and the latter those purchased in the name of the temple out of temple funds.

(c) 1 māḍai (255 of '22).

(d) 15 Nellore māḍai (356 of 1919).

From an inscription at Neyvaṇai, we learn that the interest on one kalam of paddy per year was three measures.— (ஆட்டைப் பொலிசை கலத்துக்கு முக்குறுணியால் வந்த பொலிசைக்கு) and it works out to a rate of interest of 25%. But this applied to commodities—not money. The average net yield per '*ma* of land was about 28 kalams. A grant of 247 '*mas*' yielding about 6919 kalams was made for maintaining 100 persons who were employed in maintaining a garden. (467 of '02).

*Repairs of Temples* (62/1919, 350/1919, 432/1921).

The provision of funds or lands for repairs of temples is a very laudable feature in the old scheme of things and it shines by contrast with the modern state of apathy and neglect writ large on the face of many of these ancient venerable monuments.

Royal gifts to temples were communicated by royal officers to the temple committee or Assembly of the village, where the temple was situated. If gifts were made by the Assembly or private individuals, they were formally done in the presence of royal agents.

These gifts were generally engraved on the walls of temples (296, 319 and 326/1913) and the original documents of such orders were deposited in the temple treasury (326 of 1913). The following are a few temple treasuries found in the inscriptions:—

1. Tillaivanamuḍaiya Paramēśvari Baṇḍāram (399 of 03),
2. Kulōttuṅga Śōḷāt-Tirumaḍappaḷḷi baṇḍāram (uncopied record),
3. Tiruvarangāḷum Tillaināyakan Perumbaṇḍāram (326 of 13 and 296 of 13),
4. Tirukkaioṭṭi bandāram (place of deposit of original documents of gifts, sale-deeds, etc., 459 of '02).

If the temple was to be repaired, or the inscription had become damaged or worn out, such inscriptions were copied under the supervision of royal officers and re-engraved on the wall of the renovated temple (486/1921). Curiously enough, this record refers to a gift of offerings and worship to the God for being blessed with a son thus reflecting that it was essentially an age of faith,

Temple authorities enjoyed the right of managing the temple property—endowments of moneys, jewels and immoveable property. They enjoyed the right of buying lands for the temple, letting out lands on lease, selling lands for moneys received as endowments (545 of 1921), and sometimes of temple-jewels (506 of 1926). The kings and Assemblies remitted dues and taxes on lands—either whole or part in favour of the temple. (119/1904, 350/1919, 423/1921 and 432/1921). The usual members of the temple committee who enjoyed such rights will be clear from the following extract:—(467 of '02)

" தென்னவன் பிர்மாராயரும் மதுராந்தக விழுப்பரையரும் உடையார் திருச்சிற்றம்பல முடையார் கோயில் ஸ்ரீமாஹேசுவரக்கண் காணி செய்வார்களும் ஸ்ரீகாரியஞ் செய்வார்களும் ஸாமுத்தாயஞ் செய் வார்களும் கோயில்நாயகஞ் செய்வார்களும் திருமாளிகைக்கூறு செய் வார்களும் பண்டாரப் பொத்தக முடையார்களும் கணக்கருங்கண்டு விடுதந்ததாவது"

The local officers of the king, the trustees of the temple, the committee in charge of temple repairs, the custodians of the temple-treasury and the accountant formed the members of the local executive body.

*The Mutts.*

The Mutt was another important institution of those days. Like the monasteries of the Middle ages in Europe, they served as centres of learning and poor relief.

The 12th and 13th centuries were an age of such Mutts and their decline had not yet begun. An inscription from Tiruvāmāthur (35/1922) refers to a gift of land by a private individual for the maintenance of the Āṇḍār Piccar Piraiśūḍi Āṇḍār Tirumaḍam *alias* "Tiruvēdam Aḷagiyān Tirumaḍam" situated on the north side of the temple of Āṭkonda dēvar' at Tiruveṇṇainallūr, the place connected with the spiritual realisation of Sundara Mūrti Nāyanār.

Another inscription in the same place makes provision for the burning of lamps in the "Āṇḍa Tiruvanāyakam Maḍam."

*Irrigation.*

As the King's revenue was mainly derived from land, the improvement of irrigation facilities had been the concern of the rulers. The repair of the embankment, the sluices and the irrigation channels of the irrigation tank is referred to in an inscription at Tribhuvani (in modern French territory). (182/1919).

Again a record from Tiruveṇṇainallūr (433/1921) contains a royal order to an officer "Śīnattaraiyar in charge of Villinallūr in Śēndamangalappaṟṟu" in regard to the irrigation of certain areca groves from the spring channel watering the temple-lands of Pon-meynda Śōḷamañgalam and the collection of a lower rate of tax on this." Oppressive taxation was, in the last resort, answered by migration of peoples, and the king is said to have in this case remitted the arrears of taxes due from them and invited them "to return home and take possession of their belongings." (229/1925).

*Coins.*

*Kāśu* and *Nellore Māḍai* are referred to as coins current in his days but we are not in a position to find out their actual purchasing power in relation to modern currency. The cost of lands per '*ma*' ranged from 1,000 to 3,000 Kāśus according to fertility of the soil.

60 ma's—120,000 Kāśus (545 of '21).

50 Kuḷis—1,000 Kāśus (401 of '03).

66 ma's—18,000 Kāśus (400 of '03).

1,024 Kuḷis—3,000 Kāśus (414 of '02).

13½ Kuḷis (by 14 ft. rod)—10,000 current good Kāśu (518 of '02).

8½ ma's—8,000 *Kaṭṭaiyāna* Kāśu (thick Kāśu) (432 of 24).

It is said that 9 ma's of land (20 ma's = 1 Veli) was sold for 5,000 Kāśus (261 of 1913) and 60 ma's of land was sold for 1,20,000 Kāśus (545 of 1921). This disparity in the value of land should perhaps be accounted for owing to differences of the quality of the land and therefore of its yield.

A gift of 2,800 *Kāśus* was made by a lady from the interest of which, offerings were to be made to the god of Tirukkōvilūr (320/1921).

The *Kāśu* should have been the coin prevalent in the Cōḷa country of those days. There seems to have been a decrease in the value of the *Kāśu,* especially the *Pudukkāśu* of later Cōḷa times. Sometimes we find mention of *good current Kāśu* (anrāḍunarkkāśu) and thick Kāśu (Kattaiyāna Kāśu) 518 of '02 and 432 of '04. According to an inscription No. 522/22 of Rājendra Cōḷa III a Kalañju is equal to 411½ Kāśu whereas in the days of Kulōttuñga I, one Kalañju was equal to 2 Kāśus (46 of 1914).

Māḍai or the Nellore Māḍai should have been current in the region of Kāñci and Nellore. A gift of *15 Nellore māḍai* was made for the maintenance of a perpetual lamp in the Aruḷāḷa Perumāḷ temple at Coñjeevaram (356/1919) and an inscription at Vayalaikkāvur (255/22) makes a gift of only *one Māḍai* for a lamp.

*Standard Measures.*

Various standards of measure (liquid measure) seem to have been in vogue in different parts of the kingdom and they were perhaps not of the same capacity. They were kept in each local temple treasury and payments in kind were to be made according to such standard measure.

(1) 38/1890—Coñjeevaram—*Arienna-Valla-Nāḷi.*

(2) 317/1921, 323/1921 } Tirukkōilur—*Ulagalanda Nāḷi.*

(3) 69/1918, 85/1918 } Vrddhācalam—*Devaśrayan Nāḷi.*

*Weights and Measures.*

(A) (1) 466 of '02—Cidambaram—*Śēlvi Rājakēsari* (liquid measure).

(2) 468 of '21—Tiruveṇṇainallūr—" *Adigaināyakam• marakkāl.*"

(3) 500 of 21, 497 of 21, 499 of 21 } Tiruveṇṇainallūr. " *Arumoḷi dēvanāḷi* "

(4) 353 of '19—Little Coñjeevaram.
.....—*moḷi naṅgai nāḷi.*"

(5) uncopied—Cidambaram *Ūr Ilaṅgkāl.*"

(B) *Sokkaccīyan Kōl*—(linear measure).
uncopied—19th year—Cidambaram.

*Weights.*

(C) (1) *Bandharattukkāl*—513 of '02, 515 of '02 } Tiruvaṇṇāmalai.
a necklace valued at *302 Kalañju*. (Standard Weight).

(2) Śokkaccīyan *Kāl-iḍai*—
50 of '22—Tiruvāmāttūr—
gold expressed in *Kalañju.*

(3) *Śelavukāl*—a standard weight.
508 of '02—Tiruvannāmalai.
*Law of Property* (Recovery of Land Revenue).

There is an inscription of the 16th year of the reign of Kōpperunjiñga at Pallavarāyanpeṭṭai in the Tanjore district. A certain person had not paid taxes due on his lands from the 23rd to 25th year of the king (i.e., it should be of Rājarāja III). When the auditing of the revenue accounts was done, this non-payment was discovered. As the person who was in arrears had by then died, it was ordered that the land enjoyed by his wife and son should be attached and brought for sale. The said land was made a gift to the temple for worship, offerings and a lamp for the welfare of Pillai Śōḷakōnar.

Thus the liability for royal revenue even from the descendants of the defaulter was recognised and enforced.

432 of '24—*Pallavarāyanpēṭṭai.*—

" 23 முதல் 25 வரை கணக்குக்கேட்டு இப்பேரால் சிகையான் காசுதண்டம் இதாமோதர பட்டன் அகமுடையாளையும் இவள்மகன் ஆரியதேவ பட்டனையும் இக்காசு ஒடுக்க சொன்ன இடத்து எங்களுக்கு உடல் இல்லை எங்களுடைய அருங்கான நிலத்தை திருநாமத்துக் காணியாக எழுதக்கொண்டு எங்களை ரக்ஷிக்க வேணும் என்று சொல்லுகையீல் கட்டையான காசு 8000க்கு இவன் கொழுந்தனை சடையாண்டான் திரு வீரட்டான முடையான் பட்டன் பட்டனை முதுகண்ணாக விலைப்பிரமாணம் பண்ணிக்கொண்ட இநிலம் எண்மாவரைக்கு அடைமுதல் வசப்படி நெல்லு 127 கலனே தூணிப்பதக்கால்........."

The *Ākkūr* record (229 of 1925) mentions that the people of the village left it and migrated as far as the Ganges and that Aḷagiya Pallavar *alias* Vīrapratāpar restored them by granting concessions to their lands and houses.

"......அழிந்துகிடந்த படியைக்கண்டருளி இம்மண்டலத்திற்கு நெடுங்கொடி காசுசிகை இழந்தருளி இநாட்டு.........இருபத்து நாலு கொடிகாசு சிகை இழைந்தருளி நெடுங்காலங்கிடந்த கறைகளை வெட்டி விட்டருளிக் காருண்யம் பண்ணி அருளி தேசாந்திரங்களிற் போன இவர்கள் தந்தாம் ஊர்களும் காணிகளும் மலைகளும் பெறுகவென்று திருவுள்ளமானபடியாலே கெங்கை பரியந்தமாகப் போன ஜனங்கள் நேராகப் புகுந்து தந்தாம் ஊர்களும் காணிகளும் பெற்று ஒரு குறைகள் அற இருக்கும்படி செய்தருளினார் அழகிய பல்லவரான வீரபிரதாபர் இப்படியே ரக்ஷிக்கவேண்டும்..........."

An inscription from Ōmāmpuliyūr (503 of '26 ?) tells us that a certain individual was unable to pay the *Kaḍamai* dues from him;

and he was unable to find a buyer for the lands—"puṇai vilai Koḷḷuvārai oruttaraiyum Kāṇāmaiyāle." Therefore the *stānathars* of the temple were requested to purchase the said land as *Tirunāmattukkāṇi*. The *stānathārs* having no funds at their disposal were forced to sell some temple jewels in order to carry out this transaction.

503 of '26—*Ōmāmpuliyūr.*—

*சகல புவன சக்ரவர்த்திகள் கோப்பெருஞ் சிங்கதேவருக்கு யாண்டு—அபரபக்ஷத்து பஞ்சமியும் வடகரை விருதராஜபயங்கர வளநாட்டு மேற்நா நாட்டு பிரும்மதேயம் உலகளந்த சதுர்வேதி மங்கலத்து கௌசிகன் தில்லைநம்பியும் அகில நாயகபட்டனும் முனைந்து பிரமாணம் இசைந்துவிட்டது.*

*இவ்வூர் உடையார் கோயில் ஆதி சண்டேசுவரர் விலையாக விற்றுக் கொடுத்த நிலமாவது உடையான் சோழ பிரும்மாதிராயரும் ஆளவந்தான் பேரில் பயிர் எழுதி இவர்கள் கடமை இறுத்திப் போந்த நிலத்திற்கு எங்களை புணை படுத்த கடமை நேராக இராது போகையில் பதின்மூன்றாவது அகில நாயகபட்டனில் வேறுபிரித்து காசுதரவேணுமென்று சொல்லுகையில் நாங்களும் பல இடங்களிலும்* புணைவிலை கொள்ளுவாரை ஒருத்தரையும் காணாமையாலே *இன் நாயனார் கோயில்* தானத்தார் *பக்கலே வந்து இருக்கப்பண்ணுமென்றார்கள்.* இந்நிலத்திலே திருநாமத்துக் காணியாகக் கொண்டு *தானத்தாரும்* இன்நாயனார் சாத்தி இருக்கிற திருவாபரணம் சிறிது விற்றேயாகிலும் நாயனாருக்கு நிலம் கொள்ளவேணுமென்று *கண்டு இத்திருவாபரணத்தை விற்றேயாகிலும் இந்நிலங்களைக் கொள்ளுகிறோமென்று இவர்கள் சொல்லுகையில்* இப்படி விற்றுக்கொடுத்த நிலமாவது *இவ்வூர் பவித்திர மாணிக்கவதிக்கு கிழக்கு ஜெனநாதன் வாய்காலுக்கு வடக்கு நிலம் காணி அரைக்காணி கீழே அரையே ஒரு மா முந்திரிகையும் மேல் நோக்கிய மரமும் கீழ் நோக்கிய கிணறும் உள்பட எப்பேர்பட்ட உரிமைகளும் உள்பட விற்றுக் கொடுத்தோம்—இப்பிரமாணங்கள் எழுதின ஊர்கணக்கு பூவலூர் உடையான் மூன்னாற்றுவப் பிரியன் எழுத்து—இவை பரம பிரியன் கணக்கு அவனில நல்லூர் உடையான் எழுத்து கிருஷ்ணபட்டன் எழுத்து—அகில நாயகபட்டன் எழுத்து*"

Another interesting record from Tiruvalañjuḷi (194 of 1927-'28) also refers to a similar case of default in the payment of *Kaḍamai* and there was none to stand *surety* (*puṇaippaduvār*). Somehow they managed to borrow money and pay off the *ciru-Kaḍamai* but the owner of the land fled away as he was not able to pay *Kaḍamai*. Thereupon the two sons of the owner (?) and their mother were placed under "*Vallattutanḍal*"—for a long time. Then they agreed to sell their lands to the temple as *Tirunāmattukāṇi*.

" 23. *வருஷம் காரும் ஒருபூவும் பயிர்செய்து கடமை இறுக்க இவி(வை)களுக்கு தனிச்சு* ப்புணைபடுவோர் *இல்லாமையாலே இவிகள்*

ஊரில் இருந்த பேற்கு (பேருக்கு) முன்னிறு கடமை இருக்கக்கடவதாகவும் முன்னில்லாத இருத கடமை குடிமைக்கு உடையார் திருவலஞ்சுழி உடையார் நாயனார்க்கும், வெள்ளைபிள்ளையார்க்கும் பண்டாரத்தும் மலைமண்டலத்து மலையாளர் பக்கலும் வாங்கி இருப்பதாக இவர்கள் திட்டு இட்டு சிறுகடமை இறுத்து நீக்கிநின்ற கடமை இவர்கள் இருதே ஓடிப்போகையில் இப்பேர்களால் உழவரி பட்டகாசுக்கு எங்களைப் புணைந்து இன்னாள்வரையும் வல்லத்துத்தண்டலில் வைத்து நாங்கள் நெடுநாள் படகிடந்து மிறுக்கு படுகையில் தரவுபிரித்து செலவாக வேண்டுகையில் இது இருந்தபடி கேழ்வி முதலியா[ர்] வாசங் [க] ராயர் திருமுன்பே கேட்டு அருளி வரும் இவர்கள் இட்ட திட்டுப்படியே உடையார் திருவலஞ்சுழி உடைய நாயனார்க்கு திருநாமத்துக்காணி ஆக விற்றுக்கொடுத்த காசு பிறித்தவர்க்கு செலவாகவதென்று திருவெழுத்திட்ட ஓலை தந்தருளுகையில் இவர்கள் காணியான நிலங்களும் மனைகளும் இந்நாயனார்க்கு திருநாமத்துக் காணியாக நாங்கள் விற்றுக் கொடுத்த நிலங்களும் மனைகளும்—"

This sale-deed—"*Nilavilaippramāṇa iśaivu tīṭṭu*" was made in favour of the Mahāsabhai of the dēvadāna of Akilanāyaka cēṛi in Akilāndanāyaka caruppēdimañgalam.

*Devaradiyar*: or 'dancing women' were not yet persons of ill repute. They valued temple service highly. They were custodians of the art of music and dancing and they were rich and pious-minded enough to make endowments. (448/1912 by the son of a dancing girl; 38/1922, 212/1923, 304/1913). From the *Śangam* literature we learn that lady captives in war were made to serve in temples as "Lord's Servants".

"கொண்டி மகளிருண்டுறை மூழ்கி
யந்தி மாட்டிய நந்தாவிளக்கின்
மலரணி மெழுக்க மேறிப் பலர் தொழ
வம்பலர் சேக்குங் கந்துடைப் பொதியில்"

ll. 246-9 of Paṭṭinappālai Pattupāttu.

There is reference in the inscriptions that respectable men sometimes dedicated their relatives as Dēvaraḍiyār. No. 230/1912 is an inscription of the 49th year of Kulōttuṅga I wherein Acca Piḍāram Ganavadi Nambi *alias* Aḷagiya Pāṇḍya Pallavarāyan, a general of the king, is said to have assigned certain women of his family as Dēvaraḍiyārs or temple servants devoted to "the Tiruvallam temple" and that they were branded with the trident mark (Śūlam).

The belief in the efficacy of human sacrifices, and the readiness to sacrifice one's life for the benefit of the community is well

illustrated by a gift to the younger brother of a person "who cut off his own head in order that a maṇḍapa might be completed." (119/1906).

We learn that a guild of weavers Śāliya merchants (nagarattu Sāliyar) were settled in Cidambaram and were provided with land for building their houses (Kuḍi Iruppunatham) on condition that they would supply the necessary cloths—"*Pariśattam* for the God and Goddess." The area was named '*Tiruvambalapperumāḷ-puram.*' We have even now the name of Sāliya street to that occupied by the weavers.

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"கோயிலுக்கும் திருக்காமக் கோட்டமுடைய பெரிய நாச்சியார்க்கும் சாத்தும் பரிசட்டத்துக்கும் வழக்கத்துக்கு உரு இடவும் திருவம்பலப்பெருமாள் புரமென்னும் சிவநாமத்தால் ஏற்றுகிற நகரத்துச் சாலியாக்குடி இருப்பு நத்தமாகப் பெரும் பற்றப்புலியூர்ப் பிடாகை கடவாய்ச் சேரியான தில்லைநாயக நல்லூரில் ... ... ... ...
.... ... ... .... ... ... ... ... ...
ஆக நிலம் ஆறுமா எட்டாவது முதல் நகரத்துக்குக்குடி இருப்பு நத்தமாக காணியாகப் பெறவும்"

An inscription from Āvūr (291 of '19) dated in the 30th regnal year (i.e., about 1273 A.D.) refers to a gift to God Tiru Agastīśvaram-Uḍaiya nāyanār of Āvūr in Cēdi maṅgalam on the north bank of the Peṇṇār by a merchant-guild—"*padiṉeṇbhūmi tiśai viḷaṅgum tiral-āyirattu-tigaḷ-Vaṇigar*" who claim many high-sounding titles. The expressions "*tigai anaitum,*" "*padineṇbhumi tisai viḷaṅgum*" and "*tiral āyirattu tigaḷ*" remind us very vividly of the great merchant-guild of the Cōḷa times called "Nānādēśi tiśai (or tigai) Āyirattu Aiññūruvar"—a corporation of merchants who had been carrying on extensive sea trade with foreign lands: Compare the following references in other inscriptions to this guild:—

(1) 256 of 1912—Rajendra
"*Nāṅgu tiśai yāyiramum*
*padineṭṭu-p- paṭṭanamum*"

(2) 342 of 1912—Rājadhirāja I
"*paḍiṉeṇ-viṣayattup-peruñjamayam*"

(3) Ep. car. VII SK. 118—
"*aṣṭadaśa-paṭṭanangaḷum*"

They may be described as "*an Indian East India Company*" in Cōḷa times and are said to have penetrated into the regions of the six continents by land and water routes and visited the "Cēra, Cōḷa, Pāṇḍya, Malēya, Maghada, Kausala, Saurāṣṭra, Dhānuṣtra, Kurumbha, Kāmbhoja, Gauḍa Lāṭa, Barvvara, Pārasa, Nēpāla, Ēkapāda, Lambakarṇna, Stri-Rājya, Ghōḷāmukha" and many other countries. The chief articles they traded in were superior elephants, well-bred horses, large sapphires, moonstones, pearls, rubies, diamonds, lapis lazuli, onyx, topaz, carbuncles, coral, emeralds, cardamoms, cloves, bedellium, sandal, camphor, musk, saffron, etc.

They seem to have realised that the right use of wealth is to make it available for works of public uitility and they have made charitable and religious endowments of an extensive character and it is by their enlightened benefactions that they have left behind them an indelible mark of their greatness.

The Muniśandai record (No. 61 of the Pudukotah List of Inscriptions which I have edited and published in the *Tijdschrift Voor Indische Taal-Batavia*) of Parakēsarivarman *alias* Vijayālaya Cōḷa circa, 870 A.D., the Loboe Toewa Tamil fragmentary inscription found in Sumatra and dated Śaka 1010 =1088 A.D. and the Āvur Record of c. 1273 A.D., form three distinct landmarks in the history of the famous Tamil merchant-guild and perhaps the last (the Āvūr record) contains the vestiges of that great guild which had played a great part, at least ever since the rise of the Cōḷa power, by carrying on an extensive maritime trade and by making many charitable endowments in South India.[38]

38. For further particulars about this merchant guild, vide Tijdschrift Voor Indische Taal....Land....En....Volkunkunde—Batavia-Java. Deel LXXII—Jaargang 1932 by Professor K. A. N. Sastri and *my article* on the Muniśandai Record—*Ibid* LXXIV 1934 (pp. 613-618). Dr. G. J. Dubreuil wrote to me in a private letter: "I read your paper, The Tisai Āyirattu-aiññuṟṟuvar —extremely interesting—I think that it was *in Cōḷa times an Indian East India Company* for silk, etc. Note also a temple to Viṣṇu called *Nānādēśi Viṇṇagar Āḻvār* built at Pagan as gleaned from an inscription of the 19th Century— E. I. VII, pp. 197-8.

## CHRONOLOGICAL LIST OF INSCRIPTIONS OF KŌPPERUNJIÑGA.

*2nd Year.*

1. *Śēndamangalam* (S. Arcot).—70 of 1903—Sakalabhuvana Cakravartin Kōpperunjiñga dēva. Gift of 32 cows and one bull for a lamp.

2. *Tiruvaṇṇāmalai* (N. Arcot).—505 of '02—Sakalabhuvana Cakravartigaḷ Śrī Pallavan Kōpperunjiñga dēva. Gift of 96 cows for a lamp by Aḷagiya Ciṟṟambalamuḍaiyār Nīlagangaraiyan, son of Āmūr Nīlagangaraiyan Avani Āḷappirandān.

3. *Tiruvadi* (S. Arcot). 409 of 1921.—Sakalabhuvana Cakravartigaḷ Śrī Kōpperunjiñga dēvar. Gift of cows and a bull by Koṟṟaman Palandiyarayan of Palaiyūr for a lamp.

4. *Vṛddhācalam* (S. Arcot).—69 of 1918. Nov. 13, 1244 A.D. —Sakalabhuvana Cakravartigaḷ Śrī Kōpperunjiñga dēvar—Gift of sheep for a lamp by the hereditary watchman of the temple of Tirumudukuṉṟamuḍaiya nāyanār—Mentions the standard measure *Dēvāśrayan.*

5. *Tiruppuñgūr* (Tanjore) 411 of 1918—Sakalabhuvana Cakravartigaḷ Śrī Kōpperunjiñga dēvar—Gift of land by a native of Kurucci to the temple of Śivalōkamuḍaiyāḷ Nāyanār at Tiruppuñgūr.—Provision for flowers, festival, procession, etc.

6. *Cidambaram* (S. Arcot) 397 of 1903—2yr. 13th day—Sakalabhuvana Cakravartigaḷ Śrī Kōpperunjiñga dēvar—Sale of land for 2,100 *naṟkāśu*—Mentions *nilavilaippiramāṇat-tiṭṭu.*

*3rd Year.*

1. *Cidambaram* (S. Arcot) 462/02—3yr.—325 day—Sakalabhuvana Cakravartigaḷ Avani Āḷappirandan *alias* Kōpperunjiñga dēvar—Gift for a flower-garden called " Āḻiyār tirunandavanam " by Śeñganivāyan *alias* Pillai Śōḷakōnar of Araiśūr.

2. Do. 465/02—3yr—81 day—Order of Śōḷakōn—Provision for feeding and clothing 50 persons (*tōppukkuḍigaḷ*) employed for the maintenance of a flower-garden called *" Āḻiyār tiruttōppu "* made on the western side of Vikramasingapuram. The order was caused to be engraved on the outer face of the " Kulōttuñga Śōḷan Tirumāḷigai."

3. Do. 466/02—3yr.—81 day—Order of Śōḷakōn—Gift of 1496 cows for a cow-stall called " Kulōttuñga Śōḷan tirukkōśālai "

—Also mentions a standard liquid measure called "*Selvi Rājakēsari*"—The deed was engraved on the outer face of the "Kulōttuñga Śōḷan tirumāḷigai."

4. *Cidambaram*—390/03—(Tillaiyamman Koil)—Sakalabhuvana Cakravartigaḷ Śrī Kōpperunjiñga dēvar (Astro).

Gift of lands bought for 37,000 Kasu to Nācciyār "Tillaivanamuḍaiya Paramēśvari" as *Tirunāmattukkāṇi.*

5. [Same place]—391/03—3yr.—25 day—Sakalabhuvana Cakravartigaḷ Śrī Kōpperunjiñga dēvar mentions "*Vilaipiramāṇattīṭṭu.*"

6. Do. 392 of '03—King's name not mentioned—Records sale of land.

7. [Same place]—393/03—Sakalabhuvana cakravartigaḷ Śrī Kōpperunjiñga dēvar—Sale of land for 28,000 Kāśu (*Anṛaḍu Śellum naṛkāśu*)—mentions "*Vilaipiramāṇattīṭṭu*"—(Sale deed).

8. [Same place]—395 of 03—King's name lost—Sale of land.

9. [Same place]—399 of '03—Sakalabhuvana cakravartigaḷ Śrī Kōpperunjiñga dēvar—sale of land for 28,000 Kāśu—Refers to the temple treasury called "Tillaivana-muḍaiya Paramēśvari Bandhāram."

10. *Munnūr* (S. Arcot) — 62 of 19 — Confirmation by Aḷagiya Pallavan Vīra Rāyan *alias* Kacciyarāyan of the gifts made in accordance with the grant of "*Aiya devar*" for worship and repairs to the deity of Āḍavalla Nāyanār of the temple.

11. *Tiruvadi* (S. Arcot)—50 of '03—Sakalabhuvana cakravartin Kōpperunjiñga dēvar—Gift of 39 cows and one bull for a lamp.

12. *Vṛddhācalam* (S. Arcot)—85 of 18—Sakalabhuvana cakravartigaḷ Śrī Kōpperunjiñga dēvar—date irregular—gifts of cows for a perpetual lamp to the temple by one of the Agambaḍi mudalis "Araśūrudaiyan Śenganivāyan Śōḷakōnār."

Ghee measure—*Dēvāśrayan.*

13. *Tiruveṇṇainallūr* (S. Arcot)—488 of 21—date irregular—Sakalabhuvana cakravartigaḷ Śrī Kōpperunjiñga dēvar—Gift of land by Tiruccirrambalamuḍaiyār Sundara Pāṇḍya Brahmārayan of Śōḷakulāntaka caturvēdimangalam—for offerings and festivals—Refers to a grain measure called '*Adigaināyakan marakkāl*'.

14. *Tirukkōḍikkāval* (Tanjore district)—53 of 1930-31—3 yr—(= 17th May 1244 A.D.)—Sakalabhuvana cakravartin Kōpperunjiṅga dēvar—Gift of land to the temple of Tirukkōḍikkāvuḍaiyār in Nallāṟṟūr nāḍu, a subdivision Virudarājabhayankara Vaḷanādu by Pākkam Uḍaiyan Pañcan Uḍaiya Pillai of Iḷamangalam, in Jayañgoṇḍa Śōḷa maṇḍalam, *alias* Singapuranāḍu.

*4th Year.*

1. *Tiruvaṇṇāmalai* (N. Arcot) 513 of '02—Sakalabhuvana cakravartigaḷ Kōpperunjiṅga dēvar—Gift of a necklace (*padakka-mālai*) weighing 302 *Kalañjus* by Aḷagiya Śīyan Avani Āḷappirandān Kōpperunjiṅgan to Tiruvaṇṇāmalai-uḍaiya-nāyanār.

2. *Śingavaram* (S. Arcot) 228 of 1904—Sakalabhuvana cakravartin Avani Āḷappirandān Kōpperunjiṅga dēvar—Gift of cows for a lamp.

3. *Tiruveṇṇainallūr* (S. Arcot) 449 of 1921 = 19th January 1247 A.D. Sakalabhuvana cakravartigaḷ Sri (Śīya ?) Kōpperunjiṅga dēvar—Gift of a cow by a native of Araiśūr.

4. *Tiruvāmāttūr* (S. Arcot) 35 of 1922—Sakalabhuvana cakravartigaḷ Śrī Kōpperunjiṅga dēvar—Gift of land in Avviyūr for the maintenance of a maṭha called "Āṇḍār-piccar-piṟaiśūḍi-Āṇḍār-tirumaḍam", on the north side of Ātkoṇḍa dēvar temple at Tiruveṇṇainallūr.

5. *Tiruvāmattūr*—51 of 1922—4 yr. 108 day Sakalabhuvana cakravartigaḷ Avani Āḷappirandān Kōpperunjiṅga dēvar—Gift of land purchased from the king by Aniyan Mūvēndaraiyan for offerings and worship for the merit of the king—"*dēvar tiru-mēnikku-nanrāha.*"

[52 of 1922—In confirmation of above gift by Aḷagiya Śīyan Mūvēndaraiyan.]

*5th year.*

(1) *Cidambaram* (S. Arcot) 459 of '02—Order of Śōḷakōn—Sakalabhuvana cakravartigaḷ Avani Āḷappirandār Kōpperunjiṅga dēvar—Gift of lands.

(2) Do—463 of '02—Sakalabhuvana cakravartigaḷ Avani Āḷappirandar Śrī Kōpperunjiṅga dēvar—Refers to the construction of South Gopura (Cf. Āttūr record on the same subject No. 285 of '21).

(3) Do.—464 of '02—Sakalabhuvana cakravartigaḷ Śrī Avani Āḷappirandār Kōpperunjiñga dēvar—5 yr.—314 day—Gift of lands bought for 3,000 Kāśu for digging a pond—" Perumāḷ tiruvōḍai " for growing *Śengaḷunīr* flowers to the God and Goddess—by order of Śōḷakōn.

(4) Do.—394 of '03—Sakalabhuvana cakravartigaḷ Śrī Kōpperunjiñga dēvar—Sale of land.

(5) Do.—398 of '03—Sakalabhuvana cakravartigaḷ Śrī Kōpperunjiñga dēvar—Sale of land for 50,000 *" anṛāḍu-Śel-Kāśu "*—Refers to *" Tillai-Nācciyār Koil Sri bandhāram "*.

(6) *Tiruvaṇṇāmalai*—500 of '02—Sakalabhuvana cakravartigaḷ Śrī Kōpperunjiñga dēvar (before date); then, Kūḍal Āḷappirandān Kāḍavarāyan Aḷagiya Śīyan alias Kōpperunjiñgan (*" Aḷagiya Śīyanāna Kōpperunjiñgan "*)—Gift by the King for service to God and for repairs to the temple (*tiruppaṇi*).

(7) *Tirukkōyilūr* (S. Arcot) 323 of '21—Sakalabhuvana cakravartigaḷ Avani Āḷappirandān Kōpperunjiñga dēva (=December 29, 1247 A.D.)—Gift of cows by certain individuals of Mēlaippaṇaippākkam of Idaiyāṛu nāḍu—for a lamp—mentions a liquid measure called *" Ulagalandān nāḷi "*.

(8) *Brahmadēśam* (S. Arcot) 164 of '18—Sakalabhuvana cakravartigaḷ Śrī Kōpperunjiñga dēvar—Gift of cattle for a lamp to Varamuḍaiya nāyanār by Nīlagangan Ammuri kundan Śōḷangadēvan of Āmūr.

(9) *Vṛddhācalam* (S. Arcot) 134 of 1900—Sakalabhuvana cakravartigaḷ Śrī Kōpperunjiñga dēvar. S. I. I. VII—No. 147—Gift of a gold ornament *' tirumāntaḷir '*, weighing 20 Kalañjus of 8½ ' Karat ' (*māṛṛu*) gold together with a silver string of 5 *Kalañjus* by a *dēvaraḍiyār* of the temple.

(10) *Āttūr* (Cingleput) 285 of '21—Sakalabhuvana cakravartin Avani Āḷappirandān Kōpperunjiñga dēvar—Gift of 301¼ *vēlis* of lands as *dēvadāna iraiyili,* in the village of Āṭṭūr by Āḷagiya Śīyan Avani Āḷappirandān Kāḍavan Kōpperunjiñgan for building the southern entrance (Gōpuram) of the temple of Tirucciṛṛambalamuḍaiyār at *taniyūr* Perumbarrappuliyūr (i.e. Cidambaram) as a gopura of seven storeys and called *Śōkkaccīyan,* evidently after the surname of the king. The grant was engraved both at Cidambaram and at Āṛṛūr (or Āttūr), (Cf. 463 of '02).

(11) *Tirukkaṇṇapuram*—530 of '22 " Mula Śasanam Śri madu Perunjiñgadēva "—Sale of land to a certain Rājadivākara

Mūvēndavēlār of Viliyur by Araiyan Purridañgoṇḍān Dēvaperumāl, the headman of Kurudaiyāḍi.

(12) *Āttūr*—286 of '21—5th year—The Epigraphical report says that this is a record of "an unspecified king—probably Rajaraja III". Surely this is a record of Kōpperunjiñga dēva. Gift of land to the temple of Āṟṟūdaiya nāyanār by royal order (*devar tirumugam*)—Mentions Pillaiyar Pañcanadivāṇan alias Nīlagangaraiyar as one of the signatories—Mentions a number of *birudas* in Sanskrit relating to Kōpperunjiñga—Kāḍavakula cūḍāmaṇi, Avanipālana, Gauda-baṇḍhāra-luntaka,
Pararājāntaka,
Sāhityaratnākara,
Mallāpuri-Vallabha
Kañcipuri Kāntaha
Kāveri Kāmukha.
Kṣīra pāgha Dakṣinanāyaka
Pennānadhi nātha
Kanakasabhāpati Sabha Sarva-Kārya-Sarva Kāla nirvāhaka.
Goprudu Simha Mahārāja.
Sakalabhuvana cakravarti.

(13) *Cidambaram*—3rd prakara—West wall—*uncopied*—Sakalabhuvana cakravartigaḷ Śrī Avani Āḷappirandān alias Kōpperunjiñga dēva—Order (ōlai) of Śōḷakōn—Gift by purchase of 4½ ma's of lands for the site of a flower-garden (nandavanattarai) and for the maintenance of a gardener (Text given below).

*6th year.*

(1) *Cidambaram*—296 of 1913—Sakalabhuvana cakravartigaḷ Avani Āḷappirandān Kōpperunjiñga dēvar—Order of Śōḷakōn—Certain arrangements made by the temple authorities and the village assembly regarding the gift of a flower-garden called "Tiru-nilai-Aḷagiyān tirunandavanam"—Refers to "*Tillai-nāyakan-Perumbandhāram*". Order was engraved on temple-wall.

(2) *Vṛddhācalam*—83 of 1918—Sakalabhuvana cakravartigaḷ Śrī Kōpperunjiñga dēvar—Gift of lands as "*Vidi dēvadāna iraiyili*" for offerings and a flower-garden called "Aḷagiya Pallavan Toppu" for supplying gardens by Kūḍal Āḷappirandān Aḷagiya Śīyan Kōpperunjiñgan of Tirumunaippāḍi in Kīḷ-Āmūr-nāḍu.

3. *Tiruveṇṇainallūr*—448 of 1921—Sakalabhuvana cakravartigaḷ Śrī Kōpperunjiñga dēvar—Gift by Tirumalai Aḷagiyān, alias Vīragaḷ Vīra Pallavaraiyan, the son of a dancing woman, of a bell, an incense brazier, a lamp, chain and a plate.

(4) *Tiruvennainallūr*—496 of '21—Sakalabhuvana cakravartigaḷ Avani Āḷappirandān Śrī Kōpperunjiñga dēvar—Records a number of gifts—Gift of cows by certain individuals for ghee-supply—One of the gifts is of the 9th year—"*Idan mēl Aḷagiya Śīyan Kōpperunjiñga dēvar nāḷil.*"

*7th year.*

(1) *Tiruvennainallūr*—320 of 1902—Sakalabhuvana cakravartigaḷ Śrī Kōpperunjiñga dēvar—damaged S. I. I. VII No. 949—Refers to inscriptions found on the *vimāna* of the temple at the time of its rebuilding in the 29 (26 ?) year of (Tri) bhuvana vīra-dēva.

(2) *Cidambaram*—305 of 1913—Sakalabhuvana cakravartigaḷ Avani Āḷappirandān Kōpperunjiñga dēvar—Order of Śōḷakōn—Provision for 8 *sandi* oblations at the shrine of Dakṣaṇāmūrti. The gift of land made for providing 5 of these 8 *śandis* was made tax-free—*iṛaiyili*—in the name of " Kūḍaluḍaiyān-Tittikka-Āḍuvān ". The order was engraved on the *Vikrama-Śōḷan-tirumāḷigai.*

(3) *Cidambaram*—304 of 1913—Sakalabhuvana cakravarti Avani Āḷappirandān Kōpperunjiñga dēvar—Order of Śōḷakōn—Gift of land for a flower-garden by a dancing-woman.

(4) *Tirunaraiyūr* (S. Arcot)—545 of 1921 = Oct. 29, 1249 A.D. —Sakalabhuvana Cakravartigaḷ Śrī Kōpperunjiñga dēvar—Sale of land for 120,000 Kāśu (anrāḍu-naṟ kāśu) by the managers and temple servants of the temple of Tiruppulīśvaram Uḍaiyār to those of the temple of Mūlasthānam Uḍaiyār in Tirunaraiyūr, a *taniyūr.*

*8th year.*

(1) *Cidambaram*—460 of '02—8 yr.—Gift of lands by Perumāḷ Piḷḷai alias Śōḷakōn one of the *Agamaḍi mudalis* of the king for constructing ponds for providing flowers (Śēngaḷunīr) to the God and Goddess and maintaining a flower-mandapa for the welfare of Avani Āḷappirandān alias Kōpperunjiñga dēvar.

(2) Do.—401 of '03—(Tillaiyamman Koil)—Sakalabhuvana cakravartigaḷ Śrī Kōpperunjiñga dēvar—mentions temple of Vāranavāsi Mādēvar situated on the south side of Vikrama Śōḷan-teñgu-tiruvīdi in Paḷḷippaḍai alias Vikrama Śōḷanallūr—Sale of 50 *Kuḷis* of land for 1,000 Kāśu to Śōḷakōnar for building the Piḍāriyār temple on the south side of Vikrama Śōḷan teñgu-tiruvīdi.

(3) Do.—308 of 13—Sakalabhuvana cakravartigaḷ Avani Āḷappirandān Kōpperunjiñga dēvar—order of Śōḷakōn that the *Nagaram*

*Sāliya* merchants (*nagarattuccāliyar*) were to be provided with house-sites for building their houses (*Kuḍi-iruppu nattam*) on condition that they should supply the necessary cloths (Pariśaṭṭam) to the God and Goddess. The quarters where they settled were to be given the Saivite name of (Sivanāmattāl) "*Tiruvambalapperumāḷpuram*".

(4) *Tiruveṇṇainallūr*—511 of '21—Sakalabhuvana cakravartigaḷ Śrī Kōpperunjiṅga dēvar. The maṇḍapa was erected by Arasāḷvār, the elder sister of Āḷappirandān Aḷagiya Śīyar of Perugai.

(5) *Vṛddhācalam* (S. Arcot)—135 of 1900—Sakalabhuvana cakravartigaḷ Śrī Kōpperunjiṅga dēvar—Gift of 96 sheep for a perpetual lamp by a private individual to the God Tirumudukuṉramuḍaiya nāyanār. Refers to the liquid measure "*Dēvāśryan nāḷi.*"

(6) Tiruveṇṇainallūr—497 of 1921—Sakalabhuvana cakravartigaḷ Aḷagiya Śīyan Kōpperunjiṅga dēvar—Gift of 5 cows for a lamp by Tirumalai Aḷagiyān alias Vīra Vīrapallavaraiyan, one of the *mudalis* of " . . . *Kon*".

(7) *Cidambaram*—uncopied—East wall—2nd prakara—Sakalabhuvana cakravartigaḷ Avani Āḷappirandān alias Śrī Kōpperunjiṅga dēvar—Order of Śōḷakōn—Buying of a site for a flower-garden called "*Śōḷakōn-tirunandavanam*" (Text given).

*9th year.*

(1) *Tiruvaṇṇāmalai* (N.A.)—488-b of 1902—Sakalabhuvana cakravartigaḷ Kūḍal Aḷagiya Śīyan Kāḍavarāyan Avani Āḷappirandān Kōpperunjiṅga dēvar—Gift by the queen of Śāḍum Perumāḷ.

[The same queen figures in 488 (*a*) of 1902—Rājarāja III—31 yr.—Gift by Miṭṭāṇḍār Nācciyār alias Nambirāṭṭiyār Nācciyār daughter of Peṇṇaraśiyār alias Uḍaiyāḷvār; the queen of Kūḍal Āḷappirandān Kāḍavarāyan Śāḍum Perumāḷ.]

(2) *Tiruvaṇṇāmalai*—520 of 1902—Sakalabhuvana cakravartigaḷ Śrī Kōpperunjiṅga dēvar—Order (*ōlai*) of Kūḍal Āḷagiya Śīyan Kāḍavarāyan Avani Āḷappirandān Kōpperunjiṅgan.

(3) *Tīrthanagari* (S.A.)—117 of 1904—9 yr. 219 days—Sakalabhuvana cakravartigaḷ Avani Āḷappirandān Śrī Kōpperunjiṅga dēvar.

(4) *Cidambaram* (S.A.)—318 of 1913—Order of Perumāḷ Pillai *alias* Śōḷakōn that certain gifts of lands for the maintenance

of a garden called "Avani-Āḷappirandān teñgu tirunandavanam" made for the merit of the king—'dēvar-tirumēnikku-nanrāha.'

(5) *Śēndamangalam*—71 of 1903—Sakalabhuvana cakravartigaḷ Kōpperunjiñga dēvar—Gift of 32 cows and a bull for a lamp.

*10th year.*

1. *Cidambaram*—312 of 1913—10 yr. 9 day—Sakalabhuvana cakravartigaḷ Avani Āḷappirandān Kōpperunjiñga dēvar. Order of Perumāḷ Pillai *alias* Śōḷakōn—Gift for the welfare of the king—An exchange of land—Mentions the Piḍāri-kōyil called Tiruccirrambala Mahā-kāḷi on the south side of the 'Vikrama-Śōḷan-teñgu-tiruvīdi' by which the God is taken to the sea.

(2) *Cidambaram*—327 of 1913—Sakalabhuvana cakravarti Avani Āḷappirandān Kōpperunjiñgan—Order of Śōḷakōn—Gift for a flower-garden and for sacred offerings (tiruppaṇṇikāram) to Aṇḍābharaṇa dēvar consecrated to the north of the entrance of Antappurapperumāḷ of the temple of Tirukāmakōṭṭa muḍaiya Nācciyār—i.e. modern Śiva Kāma Sundari Amman temple.

*N.B.—Aṇḍābharaṇa deva should have been set up in the shrine now occupied by Mahiṣāsura mardhani.*

(3) *Munnūr* (S.A.)—85 of 1919—Sakalabhuvana cakravartigaḷ (Ko) Perunjiñga dēvar—Gift by Kūḍal Āḷappirandān Dēvāram Aḷagiyān *alias* Vānarāyan.

(4) *Vṛddhācalam* (S.A.)—73 of 1918—1254 A.D.—Sakalabhuvana cakravartigaḷ Śrī Kōpperunjiñga dēvar—Gift of a gold forehead plate to the God by Avani Āḷappirandān, alias Kōpperunjiñga dēva of Kūḍal in Kīḷ-Āmūr nāḍu in expiation (of the sin)—*prāyaccittam*—for having killed certain Daṇḍanāyakas of the Hoysala king, Kēśava and Harihara among them, at Perumbalūr and of having seized by force their ladies and treasure. This ornament—"*cāru-ratnamayam-paṭṭam*" was called 'Avani Āḷappirandān' and was placed on the image of the God with the chanting of a Sanskrit text.

(5) *Tiruveṇṇainallūr*—459 of 1921—1252 A.D.—Sakalabhuvana cakravartigaḷ Śrī Kōpperunjiñga dēvar. Gift of cows by a brahman of the village assembly—*Sabhaiyār* of Tiruvaṇṇainallūr for offerings and service to God.

*11th year.*

1. *Jambai*—122 of 1906—Sakalabhuvana cakravartigaḷ Śrī Kōpperunjiñga dēvar—Exemption of taxes on lands in Guṇamangalam.

(2) *Jambai*—123 of 1906—Śrī Kōpperunjiṅga dēvar—Gift of paddy for service.

(3) *Cidambaram* (Śingārattōppu)—261 of 1913—Sakalabhuvana cakravartigaḷ Kōpperunjiṅga—Sale of land for 5,000 Kāśu to the Tirukkaḷāñjeḍi Uḍaiyār in Panaṅguḍiccēri, a hamlet of Cidambaram—Sale was witnessed by the Assembly.

(4) *Tiruveṇṇainallūr* (S.A.)—486 of 1921—Sakalabhuvana cakravartigaḷ Avani Āḷappirandān Kōpperunjiṅga dēvar—When the *Vimāna* of the temple was pulled down, the king got re-engraved an older inscription of the 12th year of Tribhuvana cakravartin Rājarāja dēva. This old gift was by Āṭkoḷi Kāḍavarāyan for the birth of a son—'*putrārthamāha*'.

(5) *Vṛddhācalam*—80 of 1918—11 yr, 113 day—Sakalabhuvana cakravarti Avani Āḷappirandān—Gift of a gold forehead plate—*tiruppaṭṭam*—to the God by Perumāḷ Pillai *alias* Śōḷakōnār one of the *mudalis* of the king.

(6) *Little Coñjeeveram* (Ch.)—353 of 1919—Kōpperunjiṅga dēvar—Gift of cows for a lamp to Aruḷāḷa Perumāl by a person of Nellūr-nāḍ. Refers to " . . . *moḷi-nangai-nāḷi*."

(7) *Little Coñjeeveram*—450 of 1919—Sakalabhuvana cakravartigaḷ Śrī Kōpperunjiṅga dēvar—July 20, 1254 A.D.—Gift of a lamp by a nāyaka of Malaimaṇḍalam.

(8) *Cidambaram*—uncopied—west wall—3rd prākāra—Sakalabhuvana Cakravartigaḷ Śrī Avani Āḷappirandān *alias* Kōpperunjiṅga dēvar—Order of Śōḷakōn. Gift for supplying flowers to the temple for the merit of the king—'*dēvar tirumēnikku-nanrāha.*'

(9) *Cidambaram*—uncopied—Sakalabhuvana cakravarti Śrī Avani Āḷappirandān Kōpperunjiṅga dēvar—Refers to a standard measure called '*Ūr-Ilaṅgkāl*' and a store room called " Kulōttuṅga-śōḷa-tirumaḍaippaḷḷi Bandhāram ".

*12th year.*

(1) *Tiruvaṇṇāmalai* (N.A.)—521 of 1902—Gift of a (perpetual) lamp Mallikāsana Śeṭṭi, son of Vēma Śeṭṭi of Araiyāṟṟumaṅgalam to the God.

(2) *Cidambaram*—302 of 1913—Sakalabhuvana cakravartigaḷ Śrī Avani Āḷappirandān Kōpperunjiṅga dēvar—Order of Perumāl Pillai alias Śōḷakōn—Gift of land for a flower garden called "*Tudandu Aḍimaikoṇḍān*". The lands were bought by (or an

officer of? the king called) 'Nāyanār Āḷagiya Śiyan *alias* Tamiḷnāḍu-kāthān Pallavaraiyan.'

(3) *Cidambaram*—326 of 1913—Sakalabhuvana cakravartigaḷ Śrī Avani Āḷappirandān Kōpperunjiṅga dēvar—An order of Śōḷakōn that a gift of land made for a flower-garden—" Sarvēśvaran Uḍaiya Pillai tiruppaḷḷittāma tirunandavanam "—be engraved on the wall of the shrine, and the original documents connected therewith be preserved in the temple-treasury.

(4) *Tiruveṇṇainallūr*—440 of 1921— . . . vattigaḷ Avani Āḷappirandān Kōpperunjiṅga dēvar—Gift of cows for a perpetual lamp by a member of the village-assembly—Refers to a gift made in the 21 yr. of Rājarāja III.

(5) *Mannūr*—80 of 1919—Gift of land by purchase for lamps to Āḍavalla Nāyanār by Mādēvan Kulōttuṅga-Śōḷan Mūvēnda-Vēḷān of Ambar in Śōḷamaṇḍalam.

(6) *Cidambaram*—uncopied—3rd prakāra, north wall, damaged —Sakalabhuvana cakravartigāḷ Avani Āḷappirandān alias Kōpperunjiṅga dēvar—Order of Śōḷakōn. Gift of lands for the maintenance of gardners, 10 workmen and one supervisor (nāyakan) for a flower garden made for the merit of the king by Perumāḷ Pillai, *alias* Śōlakōn—Mentions a *dēvadāna* village called 'Peṇcakravartimangaḷam'—presumably named after the queen—and newly formed by separating it from Śrī-vīranārāyaṇa-caruppēḍimaṅgalam in Virudarājabhayankara Vaḷanāḍu. (Text below)

*13th year.*

(1) *Jambai*—119 of 1906—Sakalabhuvana cakravartigaḷ Śrī-Kōpperunjiṅga dēvar—Gift of land (150 Kuḷis) to the younger brother of a person who cut off his own head—*talai-arindu-koṇḍa-idukku*—in order that a *maṇḍapa* might be completed.

(2) *Tiruvaṇṇāmalai*—519 of 1902—Sakalabhuvana cakravartigaḷ Kōpperunjiṅgadēvar—Gift for burning lamps by the temple committee to "*manṛādi* Marudan Appanāna Periya Nāttukkōn."

(3) *Tirukkōyilūr*—317 of 1921 = 1256 A.D.—Sakalabhuvana cakravartigaḷ Śrī Kōpperunjiṅga dēvar—Gift of cows for the supply of ghee by the son of a dancing woman—mentions liquid measure—"*Ulagaḷanda nāḷi.*"

(4) *Kāttumannārkōyil*—530 of 1920 = July 30, 1256 A.D.—Sakalabhuvana cakravarti Kōpperunjiṅga dēvar—Sale of land to

the temple of Maturāpuri-Emperumān by a certain *bhaṭṭan* of Vira-Sikhāmaṇiccēri, a hamlet of Vīranārāyaṇa-caturvēdimaṅgalam.

(5) *Tiruvāmāttūr*—50 of 1922—Sakalabhuvana cakravart . . . Avani Āḷappirandān Kōpperunjiṅga dēvar—Gift of certain gold ornaments—six in number—by the King Avani Āḷappirandān Kōpperunjiṅgan to God Subrahmanya set up in the temple by Kunrameḍuttān Vāṇadirayan Uḍaiyān Vayirādaraiyan of Padirimaruttūr for the welfare of the king—The ornaments weighed 25 *Kaḷañju* of '*eṭṭumāri-pon*' according to the standard weight called '*Śokkaccīyan kal*'.

*14th year.*

(1) 504 of 26—*Ōmāmpuliyūr*—Sakalabhuvana cakravartigaḷ Kōpperunjiṅga dēvar—Gift of lands as *tirunāmattukkāṇi* to the God —Vaḍataḷi-Uḍaiya nāyanār by Bālaśrayan Tirumāl-iruñjōlai, son of Karunākara Nambi of Ulagaḷanda Śōḷa caturvēdimaṅgalam, bought from Āḷappirandān Śāṇī. Refers to Rajendra Śōḷakōn Vāykkāl.

(2) Do.—505 of '26—Sakalabhuvana cakravartigaḷ Śrī Kōpperunjiṅga dēvar—Gift of land for service and repairs by Araśāḷvān Ārāvamudāḷvān.

(3) Do.—506 of '26—Sakalabhuvana cakravartigaḷ Kōpperunjiṅga dēvar—Gift of lands for service and temple repairs "*pūjaikkum tiruppaṇikkum*"—(பூஜைக்கும் திருப்பணிக்கும்) to the Ādicandēśvara dēva Kanmīs of Uḍaiyār Uḍaiyavan Vaḍataḷi Uḍaiyār of Brahmadēya Ulagaḷanda Cōḷa caturvēdimaṅgalam in Mērkā nāḍu situated in Virudharājabhayankara Vaḷanāḍu by Vādilan Araśāḷvān Āravamudu Āḷvan made up partly by his gift and partly bought from him by sale of temple jewels.

(4) *Vallam* (Cingleput)—186 of 1892—Sakalabhuvana cakravartigaḷ Śrī Kōpperunjiṅga dēvar—Gift of 300 cows by Sundara Nandi Pammar one of the *mudalis* of Pillaiyar Nīlagaṅgaraiyar in the 14th year of the reign of Sakalabhuvana cakravartigaḷ Śrī Kōpperunjiṅga dēvar.

(5) *Cidambaram*—396 of '03—Supply of saffron to Tillaivanam Uḍaiya Paramēśvari.

(6) *Jambai*—113 of '06—Kōpperunjiṅga dēvar—Gift for a festival.

(7) *Tiruvaḍiśūlam*—342 of '08—" . . -p-Perunjiṅga dēvar"—Gift of cows for a lamp—Mentions *pillaiyar* Nīlagaṅgaraiyar,

(8) Tirukkacciyūr—60 of 1932-3—Sakalabhuvana Cakravartin Kōp-Perunjiṅga dēva—14 yr. (Astro) = Aug. 1256 A.D. Provision for a flower garden.

*15th year.*

(1) *Tiruvaṇṇāmalai*—508 of 1902—Sakalabhuvana cakravartigaḷ Avani Āḷappirandān Śrī Kōpperunjiṅga dēvar refers to queen of Śāḍum-Perumāḷ. (Cf. 488-a and b of 1902)—" Kūḍal Āḷappirandān Kāḍavarāyan Śāḍum Perumāḷ nam-pirāṭṭiyār peṇṇaraśiyāna Uḍaiyāḷvār tirumagaḷār mittāṇḍar nācciyārāna nampirāṭṭiyār nāccīyār "—Mentions a standard weight *Śelavukal.*

(2) *Little Coñjeeveram*—350 of 1919—Sakalabhuvana cakravartigaḷ Kōpperunjiṅga dēvar. Assignment of certain taxes in Śōmangalam for offerings and repairs to the temple in the Aruḷāḷa Perumāḷ by Kāḍakan *alias* Nīlagaṅgaraiyan—" tiru-nilaigopurattiruvāśal-tiruppaṇikkum."

(3) *Tiruveṇṇainallūr*—447 of 1921 = 1257 A.D.—Gift of land by Rājarājadēvan Malaiyan Vaḷavarāyan, a *mudali* of the king, for lamps and another gift for a flower-garden.

(4) No. 1090—Topographical list—Vṛddhācalam—One Muḍikoṇḍaveḷān granted in the 15th year of Kōpperunjiṅga dēvar 96 goats for ghee.

*16th year.*

(1) *Cidambaram*—467 of 1902—16 yr. 262 d.—Order of Śōḷakōn—Gift for a flower garden called " Śokkaccīyan kamuku-tirunandavanam."

(2) Do.—468 of 1902—16 yr. 278 day—Sakalabhuvana cakravartigaḷ Śrī-Kōpperunjiṅga dēvar—Gift for a flower garden called " Śeṅgani-vāyan tirunandavanam "—by order of Śōḷakōn.

(3) *Jambai*—96 of 1906—April 8, 1258 A.D.—Sakalabhuvana cakravartigaḷ Śrī Kopperunjiṅga dēvar—Agreement among the residents of the country to the north of the *Avinai* and south of the *Peṇṇai.*

(4) *Tiruvadi*—44 of 1903—Sakalabhuvana cakravarti Kōp-perunjiṅga dēvar—Gift of 32 cows and a bull for a lamp—Rangachari S. A. 305; S. I. I. VIII. 316.

(5) *Tiruppārkkaḍal*—700 of 1904—Sakalabhuvana cakravartigaḷ Śrī Kōpperunjiṅga dēvar.

(6) *Vṛddhācalam*—65 of 1918—1258 A.D.—Sakalabhuvana cakravartigaḷ Śrī Kōpperunjiṅga dēvar—Gift of sheep for a lamp by a native of Jananātha caturvēdimangalam in Panaiyūr-nāḍu.

(7) *Tiruveṇṇainallūr*—439 of 1921—' . . . vattigaḷ Avani Āḷappirandān Kōpperunjiṅga dēvar. Gift of cows for a lamp by a member of the local village assembly.

(8) Do.—465 of 1921—Sakalabhuvana cakravartigaḷ Śrī Kōpperunjiṅga dēvar (= March 11, 1258 A.D.)—Gift of 32 cows and a bull by a private individual for supply of milk for the sacred bath.

(9) *Tiruveṇṇainallūr*—455 of 1921—May 13, 1258 A.D.—Sakalabhuvana cakravartigaḷ Śrī Kōpperunjiṅga dēvar—Gift of cows by Ēḷiśai Mōgan Śīnattaraiyan of Marudūr for the supply of milk.

(10) *Tiruvāmāttūr*—38 of 1922—1258 A.D.—Sakalabhuvana cakravartigaḷ Kōpperunjiṅga dēvar—Gift of 5 cows by a dancing woman to the temple for a lamp.

(11) *Vayalikkāvūr*—255 of 1922—Sakalabhuvana cakravartigaḷ Śrī Kōpperunjiṅga dēvar—Gift of one māḍai for a lamp by a merchant, a resident of Iraiyūr.

(12) *Tiruppulivanam*—(Ch.) 212 of 1923—Sakalabhuvana cakravartigaḷ Śrī Kōpperunjiṅga dēvar—Gift of cows for 2 lamps to the temple of (Uttiramērur *alias* Rājēndra-śōḷa-caturvēdimangalam by a dancing woman.

(13) *Pallavarāyan-peṭṭai* (Tj.)—432 of 1924 = 1259 A.D.—Sakalabhuvana cakravartigaḷ Śrī Kōpperunjiṅga dēvar—Refers to non-payment of taxes due from the 23rd to 25th year of the king (perhaps Rājarāja III ?) revealed in auditing the revenue accounts by Śrī Kailāsam Uḍaiyār *alias* Śōḷakōn Pallavarayar, one of the *Agambaḍi mudalis* of the King, and the subsequent attachment of his property from his wife and son, by bringing up his lands for sale on their inability to pay and the gift of the same for worship, offerings and a lamp in the temple, for the welfare of Pillai Śōḷakōnār—"Pillai Śōḷakōnār-tirumēni kalyāṇa tirumēniyāha."

(14) 1096—Topographical list—Vol. I, Vrddhācalam—One Taghavanāyakan gave in the 16th year of Kōpperunjiṅga dēva 96 goats to the deity.

*17th year.*

(1) *Śēndamangalam*—69 of 1903—Sakalabhuvana cakravartigaḷ Kōpperunjiṅga dēvar—Gift of money for 2 lamps.

(2) *Cidambaram*—307 of 1913—Sakalabhuvana cakravartigaḷ Śrī Kōpperunjiñga dēvar—Order of Śōḷakōn that the land bought by Kūḍal-uḍaiyār Tittikka-Āḍuvār for additional offerings to the shrine of Dakṣiṇāmūrti dēva be made tax-free *tirunāmattukkāṇi* under the command of the king.

(3) *Tirukkōyilūr*—320 of 1921—Dec. 26, 1259 A.D.—Sakalabhuvana cakravartigaḷ Śrī Kōpperunjiñga dēvar—Gift of 2,800 Kāśu by a lady of Nenmali alias Mitadamāḍevi caturvēdimangalam on the southern bank of the Peṇṇai for offerings to the God of Tirukkōvalūr on the Uttarāyaṇa every year from the interest on the endowment.

(4) *Kunnattūr*—196 of 1929-30—Sakalabhuvana cakravarti Kōpperunjiñga dēva—Gift of money received by the *tiruvuṇṇāḷigai sabhai* from a lady for a lamp to Dakṣiṇāmūrti set up by her in the temple.

(5) *Mēlpāḍi*—104 of 1921—Sakalabhuvana cakravartigaḷ Kōpperunjiñga dēva—Gift by " Amarābharaṇa Śīyagangan of Kuvaḷālapuram (Kōlār)—See entries under date 1204 and 1211 in H. I. S. I. of Sewell.

*18th year.*

(1) *Veḷiccēri*—314 of 1911—Śrī Kōpperunjiñga dēvar—Gift of money for a lamp to the temple of Veḷiccēri by a native of Kīranguḍi in Śōḷamaṇḍalam.

(2) *Tiruvadi*—388 of 1921—Sakalabhuvana cakravartin Kōpperunjiñga dēva—Gift of a lamp.

(3) *Tiruveṇṇainallūr*—432 of 1921—Sakalabhuvana cakravartigaḷ Śrī Avani Āḷappirandān Kōpperunjiñga dēva. The king exempted certain lands from payment of taxes, and ordered the amount to be utilised for a flower-garden—" Ānaikku-araśu-vaḷañgum-tiruttōppu "—for the God and the balance, if any, for worship and repairs to the temple. This is signed by Kōpperunjiñgan, Toṇḍaimān Viḷuppādarayan, and Guru Kulattariyan.

(4) *Little Coñjeeveram*—38 of 1890—Śāka 1182 = Oct. 31, 1260 A.D.—Sakalabhuvana cakravartin Kōpperunjiñga dēva—Gift of cows for a lamp—Mentions a standard measure called "*Aṛiennavallānnāḷi.*"

(5) *Tiruviḍaimarudūr* (Tj.)—135 of 1895, S.I.I.V. 699—Sakalabhuvana cakravartigaḷ Śrī Kōpperunjiñga dēvar—Gift of land as *tirunāmattukkāṇi*.

*19th year.*

(1) *Śēndamangalam*—76 of '03—Sakalabhuvana cakravartin Kōpperunjiṅga dēvar—Gift of 60 cows by the king.

(2) *Siddhalingamaḍam* 417 of '09—Sakalabhuvana cakravartin Śrī Kōpperunjiṅga dēvar (May 8, 1261 A.D.)—Gift of cows for a lamp by Avaniāḷappirandar Kōpperunjiṅga devar.

(3) *Tirukkoyilur* 316 of 21 (= 28th November 1261 A.D.)—Sakalabhuvana cakravartigaḷ Śrī Kōpperunjiṅga dēvar—Gift of 32 cows and a bull for a lamp by Avani Āḷappirandan Kōpperunjiṅgadēva—(*ikkal-veṭṭi-vittēn Avani Āḷappirandān Kōpperunjiṅganen*).

(4) *Cidambaram*—319 of 13—Sakalabhuvana Cakravartigaḷ Avani Āḷappirandān Kōpperunjiṅga dēvar—Śōḷakōn ordered that a gift of land for a grove of trees called "*Valzhi-aḍimai-Koṇḍān-tōppu*" be made rent free devadana land and so registered on the temple wall.

(5) *Shiyali* (Tanjore)—394 of 18—Sakalabhuvana Cakravartigaḷ Sri Kōpperunjiṅga devar—Gift of land by purchase by a native of Kūdalur in Jayaṅgonda Śōḷa vaḷanādu.

(6) 395 of 18—Sakalabhuvana cakravartigaḷ Śrī Kōpperunjiṅga dēvar—Gift of land by a native of Kurucci of offerings, etc., to the temple of Sivalōkamuḍaiya Nāyanār at Tiruppungūr.

(7) *Tirumaliśai*—13 of 1911—1 (9) yr.—Sakalabhuvana cakravartigaḷ Śrī Kōpperunjiṅga devar—Gift of houses (*manai*).

(8) *Drākṣārāma* record—419 of 1893 (Śāka 1184) 419 A and C.—mutilated—records gifts by the king to the temple of Bhīmanātha. The following titles and *birudas* are found in this record.

Sakalabhuvana cakravarti, Avanyanōdhbhava, Mahārāja Simha, Nāttyākya-Vēdāmbhudhihi, Kāṭaka-Kula-tilaka, Pāṇḍya-maṇḍala-Sthāpanā-Sutradhārā, Bharatārṇava pārīṇa, . . . , and a worshipper of "Kanaka sabhapatināṭha." He also claims to have defeated the Karnāta and Cōḷa kings.

(9) *Little Coñjeevaram*—365/19—1 (9) yr.—Gift of sheep for a lamp by Aruṇagiri Permāḷ one of the sons of *Pillaiyar* Pañcandivāna Nīlagararaiyar.

(10) *Kunnattūr* (Cingleput)—1 (9) yr. 213 of 1929-30—Gift of money for lamp by *dēvaraḍiyāḷ* Kannuḍai nācciyār.

(11) *Cidambaram*—uncopied—north wall—2nd prakara—Sakalabhuvana cakravartigaḷ Avani Āḷappirandān *alias* Kōpperunjiñga dēvar.

Gift for a flower garden called "Śokkaccīyan Kamuku tirunandavanam"—by order of Śōḷakōn. Refers also to a standard linear measure called, "Śokkaccīyan Kōl." (Text given below.)

*20th Year.*

(1) *Tiruvottūr*—83 of 1900—Kōpperunjiñga dēvar.

(2) *Tiruveṇṇainallur*—499 of 1921— . . . kkaravartigaḷ Śrī Kōpperunjiñga dēvar—Gift of cows for a lamp—Refers to a liquid measure called "*Arumoḷi-dēvan-nāḷi.*"

(3) *Little Coñjeevaram*—356 of 1919—Kōpperunjiñga dēvar—Gift of 15 *Nellūr māḍai* for a lamp in Aruḷāḷa Perumāl temple.

(4) *Tīrthanagari* (155 of 1904 ?)—Mackenzie Coll. Kōpperunjiñga dēva granted in his 20th year the village of Sennadanallūr—(235 B of S. Arcot, Rangachari's List).

(5) *Tiruvaṇṇāmalai*—514 of 1902—Kōpperunjiñga dēva—Gift of lamp by Śilanbanindān Kūttaḍuvān *alias* Cēdi-Rāyan.

(6) *Cidambaram*—uncopied—20th year, 100 day (and odd ?)—West-wall—3rd prākāra—Tribhuvana cakravartigaḷ—Avani...... dēvar . . . Śōḷakōn Ōlai—Gift of lands (2,000 Kuḷis brought for 40,000 Kāśus) for a flower garden and for the maintenance of four gardeners.

*21st Year.*

(1) *Tiruvaṇṇāmalai*—530 of 1902—Kōpperunjiñga dēvar—Gift of a perpetual lamp by "Peṇṇāṭṭuvārana Irāja-gambhīra Mārāyan" son of Dēvaraḍiyār 'Irupattu nālvaril Tukkoriyāna Tiruvaṇṇāmalai Māṇikkam'.

(2) *Ponnūr* (N. Arcot)—392 of 1928-9—Kōpperunjiñga dēvar—damaged—Gift by Śōṛappillai of Ponnūr *alias* Aḷagiya Śōlanallūr.

*22nd Year.*

(1) *Tīrthanagari*—119 of 1904—Śrī Kōpperunjiñga dēvar—Gifts of taxes to the temple—Refers to '*Alagiya Śīya Tirunandāviḷakku.*'

(2) *Tiruvottūr*—95 of 1900—Kōpperunjiṅga dēva—S. I. I. VII No. 104.

(3) *Tirukkōḍikkāval* (Tanjore)—54 of 1930-31, Oct. 9, 1264 A.D.—Kōpperunjiṅga dēvar Maṇuviruḍaiyār Varandarum Kūttapperumaḷ of Gangai-koṇḍa-Śōḷapuram set up an image of Tirupperundurai Āḷuḍaiyār on receipt of an order from Dēvar Svāmidēvar (the King himself ?).

*24th Year.*

(1) *Tiruvalañjuḷi*—199 of 1927-28—date irregular—1265 ? A.D. Sakalabhuvana cakravartigaḷ Śrī Kōpperunjiṅga dēvar.—Gift of land and house sites by Sōma dēvan of Gōmaḍam.

(2) Same place—194 of 1927-8—Sakalabhuvana cakravartigaḷ Kōpperunjiṅga dēvar—1266 A.D.—Sale of land and house sites to the temple by the Mahāsabhai of Akilanāyakacēri, a dēvadāna of Akilanāyaka caturvēdimangalam on whom the rights had devolved, as their owners were unable to pay the taxes and had left the village.

(3) *Kunnattūr* 180 of 1929-30—Kōpperunjiṅga dēva—Two Śivabrahmaṇas agreed to burn a lamp with the money given by their aunt.

*25th Year.*

(1) *Vṛddhācalam*—62 of 1918—1268 A.D.—Sakalabhuvana cakravartigaḷ Kōpperunjiṅga dēva—Gift of cows for a lamp by a native of Kūḍalūr called Tiruvarangan Periya Nārayāna Kōpperunjiṅga vēḷār.

(2) *Tirumangalakkuḍi*—226 of 1927—Sakalabhuvana cakravartigaḷ Avani Āḷappirandān Kōpperunjiṅga dēvar—Gift of land after purchase by Arayan Udayañjeydān *alias* Toṇḍaimān of Perumangalam to Ālappirandīśvaram Uḍaiyār which he set up in the Nāyakar Tirumaṇḍapa in the first *prākāra* of the Pūrnaviṭankar temple.

*26th Year.*

(1) *Tirukkōyilūr* 308 of 1902—Sakalabhuvana cakravartigaḷ Kōpperunjiṅga dēvar—Gift of 16 cows and a bull for half a lamp—Mentions standard measure—'*Ulagaḷanda nāḷi.*'

(2) *Tiruveṇṇainallūr*—433 of 1921—Seems to be a record of Kōpperunjiṅga—Order of Śīnattaraiyan who was in charge of

Villinallūr in Śēndamangalappaṟṟu re. the irrigation of certain areca groves from the spring channel watering the temple lands of Pon-meyanda Śōḷamangalam, and the remission of dues up to date and the collection of a lower rate of tax on them for sometime thereafter.

(3) *Tiruveṇṇainallūr* 466 of 1921—date irregular—Sakala-bhuvana Cakravartigaḷ Kōpperunjiñga dēvar—Gift of a silver '*Kāḷam*' (trumpet) by a private individual.

*27th Year.*

(1) *Tiruvaṇṇāmalai*—517 of 1902—Sakalabhuvana cakravartigaḷ Kāḍavan Aḷagiya A(vani Āḷap)pirandān Śrī Kōpperunjiñga dēvar—Gift by .......... Alvar queen (Nambirāṭṭiyār) of Avani Āḷappirandān Nīlagangaraiyar.

(2) *Tiruvaṇṇāmalai*—518 of 1902—Sakalabhuvana cakravartigaḷ Kāḍavan Āḷagiya Śīyan Avani Āḷappirandān Śrī Kōpperunjiñga dēvar Nañgai Āḷvār, queen (Nambirāṭṭiyār) of Avani Āḷappirandān Nīlagangaraiyar made a gift of land—13½ *kuḷis* of land by the 14 ft. rod at a cost of 10,000 *anṟāḍu naṟkāśu* for building a shrine after her.

(3) *Tiruveṇṇainallūr*—431 of 1921—1268 A.D. Sakalabhuvana cakravartigaḷ Śrī Kōpperunjiñga dēvar—Gift of a pair of silver trumpets called "*Piccan-enṟu-pāḍacconnān*"—'piccan-enru-pāḍacconnān—tiruccinnam iranḍināl—and a gold anklet for Āṭkoṇḍa dēvar of Tiruveṇṇainallūr by Udaiyān Śrī Kailāyan Uḍaiyār of Śeñji—a *madhyastha.*

(4) *Brahmadēśam*—170 of 1918—Nov. 2, 1269 A.D.—A writ of Kacciyarāyan under orders of the King (*Nāyanār tirumugam*)—Gift of lands tax-free—*iṟaiyili dēvadāna*—to the temple for festivals on the day of the asterism of Tiruvōṇam in which the King was born for the service called '*Aḷagiya Pallavan Śandhi*' and for repairs.

(5) 498 of 1921—..........'kravartigaḷ Śrī Kōpperunjiñga dēvar—Gift of cows for a lamp.

(6) *Cidambaram*—uncopied—3rd prākāra—west wall—Sakalabhuvana cakravartigaḷ Kōpperunjiñga dēvar—much damaged—Order of Śōḷakōn—Gift of land as *jīvita* to gardeners for maintaining a garden to supply flowers.

*29th Year.*

*Tiruvāyappāḍi* (Tj.)—85 of 1931-32 (= Dec. 19, 1271 A.D.)—Sakalabhuvana cakravartigaḷ Kōpperunjiṅga dēvar—The admission of certain *tirunāmattukkāṇi* lands to the benefits of the tax-free land of the village—*ūṛkil-iraiyili*—by *mūla-paruṣai* of the village of Śēṅalūṛ.

*30th Year.*

(1) *Elvanaśūr*—154 of 1906—Sakalabhuvana cakravartigaḷ Śrī Kōpperunjiṅga.

(2) Do. 159 of 1906—Gift of land in Mambattu by Ponparappinān Vāṇakkōvaraiyar—Tamil verses in praise of this chief at Kuḍimiyāmalai—Pudukōṭah State.

(3) *Āvūr*—291 of 1919—Sakalabhuvana cakravartigaḷ Śrī Kōpperunjiṅga dēvar—Gift of the image of Astra dēvar by the *Tisai vaṇigar* with many high sounding titles to the temple at Āvūr in Cēdimangalam on the north bank of the Peṇṇar—" bhumi-tiśai-viḷangu-tiraḷ-Āyirattu-tikaḷ-vāṇikarōm."

*31st Year.*

(1) *Tirukkaḷukkuṇram*—148 of 1932-3—Sakalabhuvana carkravartin Avaniyāḷappirandān (Kōp-)perunjiṅga dēvar—31 yr. = Nov. 6, 1273 A.D.—Agreement to supply ghee for a lamp.

(2) *Tiruvaṇṇāmalai*—489 of 1902 = 1274 A.D.—Sakalabhuvana cakravartigaḷ Kāḍavan Aḷagiya Śīyan Avani Āḷappirandān Śrī Kōpperunjiṅga dēvar—Gift for *saṇḍi*—called after the donor 'Tirunīṛṛu Vīramāgadha Śōḷa *Śaṇḍi* and repairs by Vāṇakōvaraiyan Tāyilum Nalla Perumāḷ Tirunīṛṛu Vīra-Māgadha Śōḷan.

(3) *Tirukkaḷukkunram* 181 of 1894 (= Feb. 10, 1274)—Sakalabhuvana cakravartigaḷ Avani Āḷappirandān Kōpperunjiṅga dēvar—[This is wrongly dated 21st year]—Gift of a lamp—"Tirukkaḷukkunṛa muḍaiya nāyanāṛkku-Kaṇṇudaip-perumāḷ-āna Irājarājak-kadangoṇḍārkku pukka meyyār paṇiyār Magalār Pañcanēdi vāṇarāṇa Nīlagaṅgaraiyarku pukka Śōḷinga nācciyār viṭṭa tirunandāviḷakku."

(4) *Manamamaḍi*—221 of 1930-31—Sakalabhuvana cakravartigaḷ Śrī Kōpperunjiṅga dēvar—Gift of cows for a lamp to the temple of Tirukkāriśvara temple by Śivadāsan Ṛṣabhavāhana dēvan Tiruvēgambamuḍaiyān and a member of the *āḷuṅgaṇam* and his brother Āḷavanda Pillai.

*32nd Year.*

(1) *Āvūr*—290 of 1919—Sakalabhuvana cakravartigaḷ Śrī Kōpperunjiñga dēvar—Mentions Māṇabharaṇa cēdiyarāyar.

(2) *Āvūr*—300 of 1919—Sakalabhuvana cakravartigaḷ Śrī Kōpperunjiñga dēvar—Gift of land for supplying sandal paste, etc., to Tiruvagattīśvaram uḍaiya Nāyanār at Āvūr.

(3) *Tiruveṇṇainallūr*—500 of 1921— . . . kkaravartigaḷ Śrī Kōpperunjiñga dēvar—Gift of a lamp to Tiruppāṇāḷvār, deity set up by the donor in Śrī Vaikuṇḍap-perumāḷ temple of the Ūr—Mentions a liquid measure '*Arumoḷi-dēvan.*'

*34th Year.*

(1) *Cidambaram*—461 of 1902—Order of Vēṇāḍudaiyān, brother of Śōḷakōn—Gift of land as *dēvadāna* for service to Goddess 'Avani Āḷappirandān Nacciyār'.

(2) *Tirukkaḷukkunram*—160 of 1932-3—Sakalabhuvana cakravartin Avani Āḷappirandār *alias* Kōpperunjiñga dēvar—34 yr.—May 20, 1277 A.D. Gift by Rājarāja Kaḍakkaṅkoṇḍār Meyyābaraṇi.

*36th Year.*

(1) *Cidambaram* 455 of 1902—Sakalabhuvana cakravartigaḷ Śrī Kōpperunjiñga dēvar—Arrangements for car-festival, service, etc., made by the Assembly of Cidambaram out of the lands presented by the land-accountant—*nilak-kaṇakku*—Darmappriyan and Tillaimūvāyira vēḷān.

(2) *Cidambaram*—456 of 1912—Sakalabhuvana cakravartigaḷ Śrī Avani Āḷappirandān *alias* Kōpperunjiñga dēvar.—Gift of land by the Assembly for a flower-garden called "*Tirunilai Aḷagiyān*" and for a lotus flower pond (*ōḍai*)—Order of Śōḷakōn to have it engraved on the wall of enclosure called 'Vikramaśōḷan-tirumāḷigai.'

(3) *Tiruvaṇṇāmalai*—487 of 1902—Gift of Kākku Nāyakadēva, younger brother of Vijaya Gaṇḍagōpāladēva "Marutāntaka Pottapi—Śōḷan Viśaya-gaṇḍa-Gōpāla-dēvar tambiyār kakku Nāyaka dēvar."

(4) *Neyvanai* 370 of 1906—Sakalabhuvana cakravartigaḷ Śrī Kōpperunjiñga dēvar—Gift of paddy for offerings and other tem-

ple requirements—" Tirunelvaṇai Udaiyār Parkadan guḍuttaṛuḷiya nāyanār Kōyil muppadu vattattu Śivap-pirāmaṇarum-kalveṭṭi-kodutta pariśāvadu."

(5) *Cidambaram*—uncopied—2nd prākāra, west wall—Sakala-bhuvana cakravartigaḷ Śrī Avani Āḷappirandān Kōpperunjiṅga dēvar—Order of Vēṇāḍuḍaiyān—Gift for certain services at the time of the car-procession and other festivals—Refers to " Kulōt-tunga-śōḻan Tiruttōppu " and " Edirisōḻan Tirunandavanam " and a hamlet of Cidambaram called " Tillai-nāyakac-caruppēdimangalam " and to a maṭha called " Tirunāvukkaraśu-Ten-Tirumaḍam " in " Ambalanāyakapperuntheru " and a street called " Rājakkaḷ Tam-birān-Tiruvīdi." (Text below.)

*Inscriptions having no regnal years.*

(1) *Ōmāmpuliyūr*—503 of 1926—Sakalabhuvana cakravartigaḷ Kōpperunjiṅga dēvar—[13th or 14th year ?]—Two persons of Uḷagaḷanda caturvēdimangalam, a dēvadāna in Mēṛka nāḍu, a sub-division of Vaḍakarai Virudharāja bhayaṅkara Vaḷanāḍu made a sale of land as *tirunāmattukkāṇi* to Āḍi-candēśvara of this temple effected by the sale of temple-jewels, as these persons were other-wise unable to mortgage their properties enabling them thereby to pay *kaḍamai* dues.

(2) *Tiruvēndipuram*—146 of 1902—Construction of the west-ern *gōpuram* of the Viṣṇu temple of Tiruvēndipuram for the merit of Avani Āḷappirandān Kōpperunjiṅga dēvar by Perumāḷ Vēṇāḍ-uḍaiyān, younger brother of Śeṅganivāyan Śōḷakōn.

(3) *Tribhuvani*—182 of 1919—Sakalabhuvana cakravartigaḷ Kāḍavan Āḷappirandān Kōpperunjiṅga dēvar—Repair of the em-bankment, sluices and irrigation channels of the irrigation tank of ' Tribhuvana Mādēvi '—Also a temple on its bank.

(4) *Cidambaram*—400 of 1903—Sakalabhuvana cakravartigaḷ Śrī Kōpperunjiṅga dēvar—Order of Śōḷakōn—Sale of land (66 *ma's*) for 18,000 Kāśu.

(5) *Shiyali.*—391 of 1918—Kōpperunjiṅga dēvar—Gift of lands as *iraiyili tirunāmattukkāṇi* to Tiruttōṇīśvaram uḍaiyār.

(6) *Tāyanūr*—358 of 1909—Sakalabhuvana cakravartigaḷ Śrī Avani Āḷappirandān Kōpperunjiṅga dēvar—Gift of cows for a lamp (*Śandiviḷakku*) to Kanakamalai Āḷuḍaiya Nāyanār by Dēvādidēvan Malaiyan the *Kiḻān* of Tāyanūr-mangalam.

(7) *Tiruvadi*—59 of 1903.

(8) *Tiruvakkarai*—191 of 1904—Sakalabhuvana cakravarti Kāḍavan Avani Āḷappirandān Kōpperunjiñgan—*birudas.* Bhūmipati Krupaṇamallah, Sarvajña-Khaḍgamallan—Building of sluice for the tank of Oḷugarai— (ஒழுகறை ஏரிக்கு மதகுசெய்வித்து இவ்வேரிக்கு நீர்புகக்காலும் கல்லுவித்தபடி).

(9) *Shiyali*—367 of 1918—[Saka]labhuvana cakravartigaḷ Śrī Kōpperunjiñga ḍēvar—Gift of land for the recitation of *tiruppadiyam.*

(10) *Shiyali*—391 of 1918—Gift of land to the temple of Tiruttōṇipuram Uḍaiyār.

(11) *Tiruvaṇṇāmalai*—480 of 1902—Tamil verse—(See Text below)—Sakalabhuvana cakravarti Kūḍal Avani Āḷappirandān Kōpperunjiñga, *biruḍas*—Niśśankamalla, Mallai Kāvala, Pallavar Perumān, Bharatam-Vallān, etc.—Various gifts of the king and his son ; the latter is said to have caused the Teluñgas to perish.

(12) *Tripurāntakam* (Kurnūl)—197, 198 and 202 of 1905—Mahārājasimha, son of Jīya Mahīpati and Śīlāvati—*birudas*—Avaniyavana Śambhava, Sarvajña-Khaḍgamalla, Niśśankamalla,—Various gifts to temples and the building of the eastern gōpuram of the Cidambaram temple.

(13) *Vāyalūr*—418 of 1922—Verses in Tamil in eulogy of Sakalabhuvana cakravarti Śrī Kōpperunjiñga *alias* Aḷagiya Śīyan who took Śōnāḍu after defeating the Cōḷa king of Teḷḷāṛu, and taking his insignia of royalty imprisoned him and his ministers—āṇai (royal order) of Śōkkaccīyan—i.e. Kōpperunjiñga—His other surnames are—the conqueror of Śōnāḍu, Semponnin-ambalakkūttanai-virumbiya dēva, Pinni-Kāvala, Pēṇu-Śen-tamil-vāḷappiranda Kāḍava, Nrpatuñga, Miṇḍḍan-Śīyan, Rājakkaḷ-Tambirān, Mallai-Vēndan, and Tribhuvanat-taraśarkaḷ-tambirān.

(14) *Ākkūr*—229 of 1925—Sakalabhuvana cakravartigal Śrī Kōpperunjiñga dēvar—Refers to the acts of public good done to the village of Ākkūr by Āḷagiya Pallavar alias Vīra Pratāpar during his pilgrimage to the sacred places south of the Kaveri after his conquest of the Hoysalas (Pōsaḷar) and the Pāṇḍiyas. He remitted the taxes and invited those who migrated owing to oppressive taxation, to return home and take possession of their belongings.

*Text of a few uncopied Inscriptions.*

## CIDAMBARAM—UNCOPIED—THIRD PRĀKĀRĀ—WEST WALL

1. ஸ்வஸ்திஸ்ரீ[ஸகலபுவனச் சக்ரவர்த்திகள்] ஸ்ரீ[அவனியாளப் பிறந்தாரான] கோப்பெருஞ் சிங்கதேவற்கு யாண்டு ஐந்தாவது ... ... ... ... ...

சோழகோன் ஓலே

2. தென்னவன் ப்ரஹ்மமாராயனும் ஜயதுங்கப் பல்லவரையனும் தில்லை அம்பலப்பல்லவரையனும் உடையார் திருச்சிற்றம்பலமுடையார் கோயில் ஸ்ரீமாஹேச்வரக் [கண்]

3. காணிசெய்வார்களும் ஸ்ரீகாரியஞ் செய்வார்களும் ஸாமுதாயஞ் செய்வார்களும் கோயில் நாயகஞ் செய்வார்களும் திருமாளிகைக் கூறு செய்வார்களும் கோயில்[கணக்கரும்]

4. ஜயங்கொண்ட சோழமண்டலத்துஊற்று [க்காட்டுக்]கோட்டத்து பாலையூர் நாட்டு பாலையூரான ராஜேந்திர சோழநல்லூர்[உமைச்சா]ணன் பொன்னம்பலக்கூத்தனது ... ... ... ... குருகுல

5. ராயன் கோயிலுக்கும் திருகாமக்கோட்ட முடையபெரி(ய) நாச்சியார் கோயிலுக்கும் சிறப்பாக திருப்பள்ளித்தாமம் அளக்க [கோயிலுக்கு] ஆள் அரையும் திருக்காமக்கோட்டமு[டையு]

6. நாச்சியார் கோயிலுக்கு ஆள் அரையும் ஆக ஆள் ஒன்றுக்கு கோற்றுக்கு நிலமாகவும் திருநந்தவனத்தறைக்கும் வடகரை ராஜாதிராச வளநாட்டு தநியூர்பெரும்பற்றப் புலியூர்.........ட

7. ......பேர் இளமைநாட்டுக் கண்ணங்குடியான மண்ணைகொண்ட சோழநல்லூர்ப்பால் பஞ்சவன் மாதேவிவதிக்கு மேற்கும் கண்டராதித்தன் வாய்க்காலுக்குத் தெற்கும் நாலாங்

8. கண்ணாற்று......சதிரத்து நடுவிற்ப்புலமென்று பேர்கூவப்பட்ட நிலத்துக்கு எல்லை வாச்சியன் திருந... ...ம் பலமுடையான் நிலத்துக்குக் கிழக்கும் நிலா... ... ... ... ...

9. ஆற்றுக்கு [தெற்கும்] நீர் அறுதிக்குமேற்கும் ஐயாறன் வாய்க்காலுக்கு வடக்கும் ஆக இவ்விசைந்த இன்னுன்கெ......உமைச்சாணன் பட்டன் சோமையாசி திருச்சிற்ற ... ... ...

10. [ம்ப]லமுடையான் தேவாதி தேவன்பக்கல் வாச்சியன் திருச்சிற்றம்பலமுடையான் திருவரை ... ... .... சன் காசு பதின்மூ[வா]யிரத்து ... ... க்கும் விலைகொண்ட ஊர் படிநிலம் நான்மாவரை

11. ... ... வடக்குப்பிடாகை கிடாரங்கொண்ட சோ ழப்பேர் இளமைநாட்டுந ... ... கரையான ஜநநாத நல்லூர்ப் பால்[திருச்சிற்றம்பலவதிக்குக்] கிழக்கு உத்தமசோழ வாய்க்காலுக் குத்தெற்கு

12. ... ... கண்ணுற்று இரண்டாஞ்சதிரத்து ... .... ஆழி ... ... கொ ... ... பேர் கூவப்பட்ட நிலத்துக்குச் சிறுவழிக்குக் கிழக்கும் உடையார் திருச்சிற்றம்பல முடையார் திரு

13. ... ... மேற்கும் பிறக்கின ... ... .... கொல்லைக்கு ... ... க்கும் ஆக இசைந்த இன்னுங்கெல்லையும் நடுவுபட்ட தொற்பட்டைபாரதாயன் சோமன் திருச்சிற்றம்பலமுடை:

14. ... ... ... யான்பேரில் இரண்டாயிரத்து இரு [நூற்றுக்]கு விலைகொண் ... ... லைகுழி ... ... நார...இருநு ... .... .... திருநந்தவனம் செய்துதிரு

15. ப்பள்ளித் தர்மம் அளக்கவும் விளைநிலம் நான்மாவரையும் கோற்றுக்கு [முத] லாகவும் இன்னிலத்துக்கு விலை ... ... ... ... ... ... சாதனங்க ... ... டுக்கி இப்

16. படிக்கு திருமாளிகையிலே கல்வெட்டப்பண்ணுதே உ இ ... ... ... ... எழுத்தெ ... ... ... ... ... ... ... ... படிகல்

## CIDAMBARAM—UNCOPIED—SECOND PRĀKĀRĀ —EAST WALL

1. ஸ்வஸ்தி ஸ்ரீஸகலபுவனச் சக்கரவர்த்திகள் அவனியாளப் பிறந்தாரான ஸ்ரீ கோப்பெருஞ்சிங்கதேவற்கு யாண்டேட்டாவது. சோழ கோன் ஓலை தென்னவன் பிரஹ்மமாராயரும் ஜயதுங்கப்பல்லவரயரும் தில்லை அம்பலப்ப

2. ல்லவரயரும் உடையார் திருச்சிற்றம்பலமுடையார் கோ யில் ஸ்ரீமாஹேசுவரக் கண்காணி செய்வார்களும் ஸ்ரீகாரியஞ் செய்வார் களும் சாமுதாயஞ் செய்வார்களும் கோயில் நாயகஞ்செய்வார்களும் திருமாளிகைக் கூறு செய்வார்களும் கணக்கரும் கண்டு விடு

3. தந்ததாவது கோயிலுக்கும் திருகாமக்கோட்டமுடைய பெ ரிய நாச்சியார்க்கும் சாத்தி அருளத்திரு பூமண்டபத்துக்கு முதலாகத் திருப்பளித்தாமமளக்கப் பெரும்பெற்றப் புலியூர் பிடாகை மணலூ ரான கங்கைகொண்ட சோழ நல்லூரில் செய்வித்த

4. சோழகோன் திருநந்தவனத்துக்குத் திருநந்தவனத்தறைக்குட லாகப் பொன்மேய்ந்த பெருமாள் திருநந்தவனத்துடன் கூடின மகளங் கக்காரன் திருநந்தவனக்குடிகளுக்கு இவ்வூரில் பலவாவையான் நில த்து ஜீவிதமாய் மாறிக் கூடின நி

5. லம் அரையே இருமாவரையின் கீழ்முக்காலும் திருக்களா ஞ்செடியுடையார் கோயில் வடபக்கத்து எழுந்தருளி இருக்கும் வி (க்னே)சுவரதேவர் கோயில் ஸ்தானத்தார் பக்கல் விலைகொண்ட ஊர்ப் படி நிலம் அறுமாவின் கீழ் ஒன்பது மாக்காணி

6. அரைக்காணியினால் விரிவுநிலம் எழுமாவரையே அரைக் காணி முந்திரிகைக் கீழரையும் உமைச்சாணன் திருச்சிற்றம்பலமுடை யானுக்கு மன்னியதேவன் பக்கல்விலைகொண்ட ஊர்ப்படிநிலம் அரை மாவின் கீழ் முக்காலினால் விரிவுநிலம் அரைமா

7. வரைக்காணி முந்திரிகைக்காலும் நாவலுடையான் திருநந்த வனமாகக்கொண்ட நிலமாய்க் கூடின நிலம் இரண்டு மாக்காணியும் ஆக நிலம் ஒன்றே மூன்றுமாவரைக் காணி முந்திரிகைக் கீழரையும் திருநந்தவனமாகச் செய்யவும் இதிருநந்தவன

8. த்துக்கு விலைகொண்ட ஸாதனமும் குடிக்காணியில் விலை கொண்ட நிலத்துக்கு மடங்குவரி கழிக்க மூலபருஷையார் எழுதின நியோகமும் இத்திருநந்தவனஞ் செய்கிற திருநந்தவனக்குடிகளுக்குக் குடியிருப்பு நத்தமாக பரகேசரிநல்லூர் மாசிலாமணியாண்டா

9. ரகரம் தில்லைவாழந்தணச் சருப்பேதி மங்கலத்துப்பலர் பக் கலும் விலைகொண்டு உடைய தென்சிறகிலும் மேல்சிறகிலும் மனை கோல் முப்பதேமுக்காலே இரண்டு மாவினால் குழி இருநூற்றெழுபத் தேழரையே மூன்றுமாவும் விலைகொண்ட ஸா

10. தனமும் திருக்கை ஓட்டிப்பண்டாரத்தே ஒடுக்கவும் இப் படிக்குத் திருமாளிகையிலே கல்வெட்டவும் கடவதாகப்பண்ணுவதே

## CIDAMBARAM—UNCOPIED—THIRD PRĀKĀRĀ— —NORTH WALL

1. ஸ்வஸ்திஸ்ரீ; உ ஸகலபுவன சக்கரவர்த்திகள்

ஸ்ரீ[அவனியாளப்] பிறந்தாரான கோப்பெருஞ் சிங்கதேவர்க்கு யாண் டுஉ (12)வது சோழகோன் ஓலைதென்னவன் ப்ரம ...... தில்லை அம் பலப்ப ... ...

2. கோயில் நாயகஞ் செய்வார்களும் திருமாளிகைக் கூறுசெய் வார்களும் கணக்கரும் கண்டு விடுதந்ததாவது உடையார் திருச்சிற்றம் பலமுடையார்க்கு சாத்தி அருள [விருதராஜபயங்]கர வளநாட்டு ஸ்ரீ ... ...த சுத்த மலிநல்லூர்

3. நல்ல ஆக்கிப்பறித்து திருப்பூமண்டபத்துக்கு முதலாக அள க்கத் திருநந்தவனக் குடிகளில் முதல்கொண்ட பேர் பத்துக்கும் நாய கம் பேர்[ஒன்றுக்கும்] இலக்கைக்கும் கொற்றுக்கும்......பெண் சக் கரவத்தி மங்கல ... ... .... ஆதிமங்கலவன்தேவ ...

4. முஞ்சுத்த விலைகொண்ட விருதராஜ ... ... ஸ்ரீ வீரநாராயணச் சருப்பேதி மங்கலத்து வேறுபிறிந்த உடை[யார் திருச் சிற்றம்பல] முடையார் தேவதானம் பெண் சக்கரவத்திமங்கலத்து ... சந்திரசேகர வாய்க்கா

5. இரண்டுமா முக்காணி இதில் தெற்கடைந்த ஒரு ... ... ... ... அரைமாவும் பத்தாங் கண்ணுற்று இரண்டாஞ் [சதி ரத்து] ... ... ஆறுமாவில் தெற்கடைய நிலம் இருமா வரை யில் மேற்கு இதன்மெற் ... ... இதன் வடக்கும் ஒருமா

6. மும்மாவரையும் இம்மங்கலத்து சிறுகாமூரில் மூன்றுங்கண் ணுற்று மூன்றுஞ்சதிரத்துக் கீழை அறுமாவில் தெற்கடைய கிழக் கடைய ... ... ககீழரையும் இதின்.

7. நீக்கி நிலம் காணி முந்திரிகைக் கீழரையும் ஆக நிலம் ஒருமா முந்திரிகை .... வரை முந்திரிகையும் பேண் சக்கரவத்திமங்கலத்து நாராயணன் ஜாதவெ ....

8. வடக்கு பத்தாங் கண்ணுற்று இரண்டாஞ்சதிரத்து மேலை ஆறுமாவில் தெற் ... ... மாவில் கிழக்கடைய நிலம் ஒரு மாவும் புள்ளமங்கலத்து

9. வ[டி]திக்குக்.கிழக்கு ... ... வாய்க்காலுக்கு வடக்கு ... ... தெற்கடைய நில எட்டுமாவில் கிழக்கடைய நிலம்...

10. முக்காணியும் ஆக ... ... ஸ்ரீ பராந்தகசோழன் மங்கலத்து [தி]ருச் சிற்றம்பலமுடையான் பக்கல் காசு எண்ணாயிரத் துத் தொளாயிரத்[து] தெழுபதுக்கு பெண்சக்கரவத்திமங்கலம் சிறு

11. ... ... ... ரையின் ... ... முந்திரிகைக் கீழ் முக்காலும் புள்ளமங்கலத்துத் திருவன் ... ... டாயிரத் துக்கு பெண்சக்கரவத்தி மங்கலம் மன்னார் ஸ்ரீவீரநாராயண

12. இதன் ... ... யிரத்துக்கு பெண்சக்கரவத்தி மங்கல

13. மங்கல மன்னூர் ஸ்ரீவீரநாராயண வதிக்கு கிழக்கு ... ... ... ... முதல் கண்ணாற்று ... ... தெற்கடைய டக்கல் காசு

14. ண்டாஞ் சதிரத்து மேலே ஆறுமாவில் வடக்கடைய ... நீக்கி நிலம் ஒருமாவரையின் கீழ் ... ... முக்காணி முந்திரிகைக் கீழரையும் விலைகொண்டு திருக்கை ஒட்டி ... ...

15. இவை சோழகோன் எழுத்து என்னும் புகுந்த ஏவற் றீட்டின்படி கல் வெட்டியது இது தேவர் திருமேனிக்கு நன்றாகச் செய்வித்தார் பெருமாட் பிள்ளையான சோழ கோனார்.

## CIDAMBARAM—UNCOPIED—SECOND PRĀKĀRĀ —NORTH WALL

1. ஸ்வஸ்திஸ்ரீ ஸகலபுவனச்சக்கரவர்த்திகள் அவனியாளப் பிறந்தாரான கோப்பெருஞ் சிங்கதேவர்க்குயாண்டு பத்தொன்பதாவது சோழகோன் ஓலை தென்னவன் ப்ரமாராயரும் ஜயதுங்கப்பல்லவரையரும் குரு குலத்தரையரும் உடையார் திருச்சிற்றம்பலமுடையார்

2. கோயில் ஸ்ரீமாஹேசுவரக் கண்காணிசெய்வார்களும் ஸ்ரீகாரியஞ் செய்வார்களும் ஸாமுதாயஞ் செய்வார்களும் கோயில் நாயகஞ் செய்வார்களும் திருமாளிகைக் கூறுசெய்வார்களும் கணக்கரும் கண்டுவிடுதந்தாவது கோயிலுக்கும் திருக்காமக் கோட்டமுடைய பெரிய நாச்சியார்க்கும் வேசாலிப் பாடிப்பற்றுப்பால் சுந்தரசோழநல்லூரில் செய்வித்த சோக்க

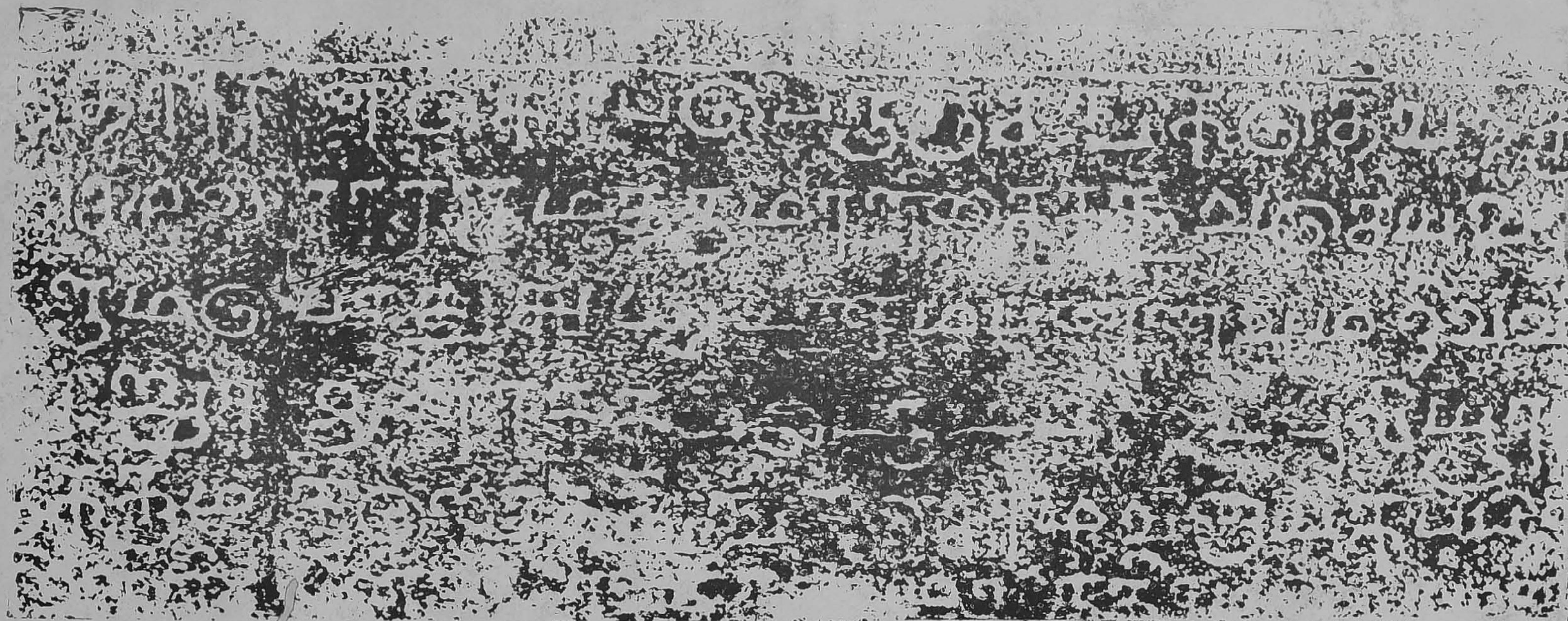
3. ச்சீயன் கமுகுதிருநந்தவன நிலம் அறுபத்து மூன்றுமாமுக்காணிக்கீழ் முக்காலும் சோக்கச்சீயன் கோலால் அளந்த இடத்து இத் திருநந்தவனத்து சுற்றுக்குலைக்குட்பட்டது பதினாறு மாவரைக்காணி முந்திரிகைக் கீழ்க்கால் நிலம் அளவேற்ற முண்டாகையாலே இந்நிலத்துக்கு பதினெட்டாவது வரையும் கடமையாகக் கூட்டினகாசு தவிர்வதாகவும் இந்நிலம் உள்பட எண்பது

4. மாநிலமும் திருநந்தவனமாவதாகவும் திருமாளிகையிலேகல்லு வெட்டி விப்பதர்க்கு தேவர் திருமுகம் வந்தமையில் இத்திருமுகம் திருக்கை ஒட்டிப் பண்டாரத்திலே சேர்த்துக்கொண்டு திருமுகப் படியே அளவேற்ற மானநிலம் பதினாறுமாவரைக்காணி முந்திரிகைக் கீழ்காலும் உட்பட எண்பதுமா நிலமும் திருநந்தவனமாவதாக முன்பு பெரிய

5. தேவர்க்குப் பதினைஞ்சாவது நாளில் இத்திரு நந்தவனத்துக் குத் திருமாளிகையிலே கல்லுவெட்டின இடத்திலே கல்லுவெட்டி



Southern Gōpuram—Natarāja Temple, Cidambaram,
called Śokkaccīyan, built by Kōpperunjiñga.



A PORTION OF THE INSCRIPTION OF KŌPPERUNJIṄGA DĒVA.

வைக்கவும் நடவதாகப் பண்ணுவதே இவை சோழகோன் எழுத்து என்று எழுதிப்புகுந்த ஏவற் றீட்டுப்படிகல் வெட்டியது

## CIDAMBARAM—UNCOPIED—SECOND PRĀKĀRĀ —WEST WALL

1. ஸ்வஸ்திஸ்ரீ ஸகலபுவன சக்ரவத்திகள்

ஸ்ரீ அவனி ஆளப்பிறந்தாரான கோப்பெருஞ் சிங்கதேவற்கு யாண்டு முப்பத்தாறுவது வேணுடுடையான் ஓலே தென்னவன் பிரம்ம மாராயரும் ஜயதுங்கப்பல்லவராயரும் தில்லையம்பல பல்லவரையரும் உடையார் திருச்சிற்றம்பல முடையார் கோயில் ஸ்ரீ மாகேச்வர கண் காணி செய்வார்களும்

2. ஸ்ரீ காரியஞ் செய்வார்களும் சாமுதாயஞ் செய்வார்களும் கோயில் ஞயகஞ் செய்வார்களும் திருமாளிகைக் கூறுசெய்வார்களும் பண்டாரப் பொத்தகமுடையார்களும் கணக்கரும் கண்டுவிடுதந்ததா வது நாயகர் திருத்தேர் எழுந்தருளும்போது திருப்புறக்குடையில் **அத்தியனம்** பண்ணி சேவிக்கவும் நாயகர் குலோத்துங்கசோழன் திருத் தோப்பில் ஏறி அருளினல் ஸ்வஸ்தி

3. சொல்லி சேவிக்கவும் இத்திருக்கோயில் திருமஞ்சனம் பண் ணி அருளும்பொது **அத்தியனம்** பண்ணவும் திவஸங்களுக்கு பிள்ளை யார் சிவபாத சேகரன் சித்தைத் துணைப்பெருமாள் எதிரிலிசோழன் திருநந்தவனத்து திருப்பாலிகை வலஞ்செய்ய எழுந்தருளினல் **மிருத்து க்ரஹணம்** பண்ணவும் எதிரிலிசோழன் திருநந்தவனத்து மேல் பக்கத்து தில்லைநாயகச்சருப்பேதி

4. மங்கலம் என்னும் திருநாமத்தால் திருவையாறுடையார் வைத்த அகரத்து ப்ராமணர் க்குப் பெரும்பற்றப் புலியூர் பிடாகைக ளில் இவர் பலபக்கலிலும் விலைகொண்டு குடுத்த நிலமும் இந்த ப்ராம ணர் பலபக்கலிலும் தாநமாக பெற்ற நிலமும் உள்பட நிலம் ஒன்பதரை யும் அம்பலநாயகப் பெருந்தெருவில் திருநாவுக்கரசு தென்திரு மடத்து உடையார் அழகிய திருவை

5. யாறுடையார் திருக்கோயில் கீழ்பக்கத்து முகக்கட்டணத்து எழுந்தருளி இருக்கும் குலோத்துங்க சோழவிநாயகப் பிள்ளையாரை இராசாக்கள் தம்பிரான் திருவீதியில் நாயகர் எழுந்தருளி திருக்கண் சாத்தி அருளும் நாக்கள் திருக்காட்ச்சி சேவிக்கவும் திருப்பண்ணிகா ரம் அமுதுசெய்யவும் இவர் கொண்டுவிட்ட நிலம் அரையும் ஆகநிலம் பதிற்றுவேலியும் மூல பருஷையார் எழுதின மஹா

6. ஸபா நியோகப்படியே கோயில் குடிமை திருவேரங்கு வீர போகம் படவரசி உள்ளிட்டன தவிர்வதாகவும் விக்கிரம சோழன் திருமாளிகையில் கொற்றங்குடி [யி]ல் இருமரபுந் துய்யபெருமாள் சருப்பேதி மங்கலத்து ப்ராஹ்மணர்க்கு கல்வெட்டின இடத்துக்கு அருகே கல்வெட்டவும் [க]டவதாகப் பண்ணுவதே இவை வேணு டையான் எழுத்து என்று புகுந்த ஏவற்திட்டின்படி கல்வெட்டியது

## TIRUVAṆṆĀMALAI INSCRIPTION 480 OF 1902.

## திருவண்ணாமலைச் சாசனம்

### (அகவல்)

கார்வளர் மேனிக் கமலக் கண்ணன்
பார்வளர் உந்திப் பல்லவர் பெருமான்
சகல புவன சக்கர வர்த்தி
கூட லவனி யாளப் பிறந்தான்
கோப்பெருஞ் சிங்கன் கழற்கா டவன்கோன்
சொன்மறை யரக்கன் சுடர்வா ளெடுத்துப்
பின்வர நடந்து பிலந்திறந் தருளிய
காவலர் தம்பிரான் கண்ணு ரமுதர்
அருண மலைவளர் பெருமா னனக்குச்
செய்த திருப்பணி தெரிந்தெடுத் துரைப்பிற்
காதிற் கம்பியுங் கதிர்மணி மகுடமும்
செங்கதி ரெறிக்கு மங்க சுத்தமும்
பாகு வலயமும் பைம்பொற் பலதொழில்
திருவுடை யாடையுந் திருக்கழற் கிழிரும்
பேதை பாதமும் பிறங்கிருட் கண்டமும்
இளஞா யிற்றி னெழினிறந் தோன்ற
வளர்மா ணிக்க வாள்வெயி லரும்பிய
விரிகட லவனி யாளப் பிறந்தான்
திருவா சிகையுஞ் சிங்கா சனமும்
கற்பக விருக்கமு முத்தின் பந்தலும்
ஓடரி மைக்கண் உமையிசை பாட
ஆடிய வதிருங் கழற்பெரு மானுக்
கினமா ணிக்க மிலங்கச் செய்த

Note.—My thanks are due to Mr. V. M. Subrahmanya Ayyar for his help for rendering this into verse form.

பரதம் வல்ல பெருமா ளென்னும்
திருவா சிகையுஞ் சிறந்தசெங் கதிரொளி
விளங்குமா ணிக்கமுந் துளங்கும் வயிரமும்
கட்டிய பொலன்திரு மஞ்சனக் கடமும்
கண்ணு ரமுதர் காமக் கோட்டத்து
உண்ணு முலையா முமையவள் தனக்குப்
பருமணி நிரைத்த திருவுடை யாடையும்
வென்றிவேல் கொண்டு குன்றெறி முருகன்
செந்நிற மேனியுந் தேவியர் மேனியும்
மைஞ்ஞிறத் தோகை வண்ணமு மடையப்
பொன்னிற மாக்கிய பொற்பணி பலவும்
மல்லை காவலன் நிச்சங்க மல்லன்
பல்லவர் வேந்தன் பரதம் வல்லன்
கூட லவனி யாளப் பிறந்தான்
செய்தன விப்பணி யடங்கலுஞ் சிறந்திவண்
ஊழி காலம் வாழி யிவன் மகன்
வாடா வாகைக் காடவ குமாரன்
வான்புகழ் மல்லையு மயிலையுங் காஞ்சியும்
தண்டக நாடுந் தண்புனற் பாலையும்
பெண்ணையுங் கோவலும் பொய்கையு முடையவன்
எண்ணருஞ் சிறப்பின் யாவரும் மதித்த
விருதரில் வீரன் விறல்வீ ரசனி
கரிய நாதன் காதற் குமாரன்
குடதிசைக் கருநடர் தென்புலங் குறுகவும்
வடதிசைத் தெலுங்கர் வடக்கிருந் தழியவும்
போர்பல கடந்து பொருந்தா மன்னவர்
ஆரெயிற் செறிந்தூர் மலையர ணழித்து
நல்லிசைப் படாம்புனை நன்னன் வேற்பில்
வெல்புக ழனைத்து மேம்படத் தங்கோ
நிலையுங் குரங்கும் விசையமுந் தீட்டிய
படர்புண் ணெடுவே லாட்கொண்ட தேவன்
கடகரி முனைமுகங் கடந்த காங்கயன்
கண்ணு ரமுதர் கனங்குழை பாகத்து
அண்ணு மலையற் கன்புகெழு நெஞ்சில்
விருப்புடன் செய்த திருப்பணிக் கோவை
யாவையு மெடுத்துப் பாவல ருரைப்பின்
நின்ற தொல்புகழ் நிலமுழு தளித்த
வென்றிபுனை தோளாற் கொண்ட தேவன்
வேணு டுடையா னென்னும் பெயரால்

நீணாள் வாழ நிலைபெறச் செய்த
பெருமா ளமருந் திருமண் டபமும்
மருக்கமழ் கனகத் திருப்பள்ளி யறையும்
திருவமு தியற்றும் பெருமண் டபமும்
விரிவுடன் செய்திருக் காக்கிள்ளியும்
பெருவிற லவனி யாளப் பிறந்தான்
திருமண் டபமுஞ் செழுமலர்த் தொடுத்த
கண்ணி வாடாது கண்ணிமை யாது
மண்மிசை நடவா வானோர் வலம்வர
வெண்மதி நிலவில் விளங்குசுட ரெறிக்கும்
படித்தல மெள்ளவும் படிமூன் றாக்கும்
அடித்தல மெள்ளவு மடையா மன்னவர்
மலைத்தலம் பறித்தம் மன்னவர் சுமந்த
சிலைத்தலங் கொண்டு செய்த சிலைத்தலமும்
எல்லையி லுகந்தொறுஞ் செல்வந் தொலையாது
வரும்படி வகுத்த நிச்சங்க மல்லன்
பெரும்பண் டாரமும் பிறைமுடிப் பெருமாள்
இந்நா ளுவந் திருந்தமை தோன்றவும்
முன்னா ளளந்த முறைமை காணவும்
வாட்டடங் கண்ணியர் மனைதொறும் பலிகொளக்
காட்டிய படிநற் கங்காள வேடமும்
வான்முகத் தமரர் வணங்கச் செய்த
நான்முகத் தொரு நாயகி தனக்கும்
அப்படி வகுத்த அணிநெடுந் தேரும்
செப்பிய கதிரவர் திசைவலம் போதும்
சோதி நன்மணி வீதிக ளிலங்க
கலைபயில் தவத்தோர் நிலைபெற விருக்க
மலைவகுத் தனைய காங்கயன் மடமும்
கானம் பயிலுங் கடவுளர் தமக்கு
வேனிற் றென்றல் வியன்பெருங் கவரி
இருமருங் கிரட்டவு மிமையவர் துதிக்கவும்
அ(ம?) ருமணம் பெருகிய வாள்வல பெருமாள்
திருநெடுந் தோப்புந் தீர்த்த மாகிய
அமுதநன் னதியும் அனைத்திலுந் தூய
தமிழ்நாடு காத்த பெருமாள் தடாகமும்
வண்டிசை பாடு மதுமலர் வாசங்
கொண்ட காடவ குமாரன் தோப்பும்
கவன வெம்பரிக் கதிர்வழி தடுத்த
அவனி யாளப் பிறந்தான் தோப்பும்

தலநிகழ் சேனைத் தலைவன் தோப்பும்
வெம்மை நாளில் வெஞ்சுர மடைந்தவர்
தம்மனங் குளிரத் தண்டலை நிழற்செயும்
அம்மை மடமு மைய னேரியும்
வெற்பகம் துளைத்தெனக் கற்புடையாகிய
அடனெடும் பிலத்தி லமுதுவந் தெழுந்த(டுத்த)
வடிவாள் வல்ல பெருமாள் கிணறும்
அளிமுரல் கமலமு மாம்பலு மலர்ந்து
குளிர்புனற் காடவ குமாரன் தடாகமும்
குன்றுகரை யன்ன கோடுயர் நெடுங்கரை
வென்றுமலை கொண்ட பெருமா ளேரியும்
சுரர்தரு நெருங்கிய சோலையு மொவ்வாப்
பரதம் வல்ல பெருமாள் தோப்பும்
வரிஞிமி றூர்க்கு மடலினம் பாளை
விரைகமழ் வீர ராயன் தோப்பும்
தவநெறிச் சுந்தரர் தம்பெருங் குலத்தில்
.... .... .... .... செய்து கொடுத்த
கடலென நிறைந்து கார்வயல் விளைக்கும்
வி .... .... சை நிச்சங்க மல்ல னேரியும்
காங்கயன் தடாகமுங் காங்கயன் மடமும்
பூங்கமழ் சோலையும் பொற்புடன் விளங்க
இவ்வகை யாவையுஞ் செய்தன னதனால்
பாவை பாகன் சேவடித் தாமரை
பணிந்த சென்னியர் பார்க்கும் கண்ணினர்
அணிந்த நீற்றினர் (நெற்றியர்) ஆகம நன்னெறி
படிந்த நெஞ்சினர் பரசம யங்களைக்
கடிந்த ஆணையர் கண்ணுதற் பெருமான்
ஆதி நாதனுய வேடங் கொண்டு
பாய்புனற் கங்கை ஆயிர முகங்கொண்டு
ஆர்த்தெழு மந்நா ளேற்றுக் கொண்ட
திருந்திய பிறைமுடி அருந்தவச் சடாதரர்
ஆதியில் அஞ்செழுத் தோதிய தொண்டரென்
றெண்ணிய நாற்பத் தெண்ணு யிரவரும்
திருவரு ளிவன்மேல் வைத்தனர்
இருநிலந் தன்னி லினிதுவாழ் கெனவே.

* NOTE.—There is a certain Perumāḷ ēri (a big irrigation tank) in the Cuddalore Taluk of the South Arcot District. It is not unlikely that it is named after Kōpperunjiṅga and to be ascribed to him (Sāḍum Perumāḷ).

## THE DRĀKṢĀRĀMA RECORD OF KŌPPERUNJIṄGA (ŚĀKA 1184)

419, 419-A and 419-C of 1893.

S.I.I. IV (in Telugu Script).

419 OF 1893

श्री स्वस्ति **सकलभुवनचक्रवर्ति यवन्यवनोद्भव महाराजसिंहः ।**

कर्न्याटेश्वर वाहिनीचय......हातोद्धतस्सर्वोर्वी शतया चरत्यनुदिशं च्छोढोपि यद्विक्रमैः सोयं.......क्काठकपार्थिवान्वयरविस्सर्वानवत्यन्वहं ।

सौवर्णं मकरांकतोरणमहा.......यद्बुदं षामृस्तिति विवेकमंद्धर बलान्नाथ्या- **ण्यवेदांबुधिः** गंभीरसु.........

मनोविभावितरसंस्सवर्थिरत्नप्रसूः ।

**प्रादात्काकति भूपतेस्स**......भूभोगदक्षापतिर्दाक्षारामनिवासिने भगवते भीमाय हैमं प्रभं ।

1342. (419-A) of 1893.

१. ......दिशं प्राप्ते दक्षिणां दिनकरे सः । **कर्नाटाधिपभवन्य- वनोद्भवं** सुरगिरिनिभं हैमं भीमेश्वराय वरासनं । आदाय प्रत्यग्रः कनक(क)(लि)तः कल्पविटपिसमुत्तुंगस्कन्दे जग.......

२. दवनजात् **क्षीतिभुजा सुतेन त्रैलोक्यविदितयेशसः काकतिपते- रयं** भीमेशो त्रिपदवति चूडेय(म्मह)सेदाक्षारामाभिरामाय विरूपाक्षाय तेजसे...... खण्डवर्तिसौवर्नमदान्मकरतो......

३. ......भीमनाथाय रो. काटक......कनकांदोलमवन्यवनसम्भवः ॥ मण्डि(तं) हैमदंडेन सुवाक्यव्यजनोत्तमं । अकरोत् भीमनाथाय श्रीकाटक- महोत्सवः । (वि)रामा...

४. ण । मासे चा......वौशने व्रादादा- चंद्रतारं......जात......

५. ..............दत्तवित्त.......क

S.I.I. IV 1342-B (419-C.) OF 1893

१. स्वस्ति (...) श्री **सकल भुवन चक्रवर्तिना काटककुलतिलकेन** कर्नाट (भूप) मानमर्दि(ना) चोरकुलारिकुल कानन विदलन मत्तकुंजरेण········ पांड्यमंडलस्थापनासूत्रधारेण पंडित जनोपकरणी भूत सांब्राज्य संपदा सं······

२. रससाहित्यसागरसांयात्रिकेण **भरतार्णवपारीण**······(विति) तकी-र्तिना **क (के) ति पतेः (पा) दारविंदमधुकरायमानमानसेन परममादेश्वरेण** महाराज**सिंहवरनाम**धेयेन **श्रीमदवन्यवनसंभवेन** राज्ञा (भ)

३. गवते भीमनाथाय दत्तेषु सिंहासन **मकरतोरण** क(ल्प) (री) (दण्ड) **कनकान्दोलन**·········न दात्तिरिकाहलादि····(न्)र्म्मया लिखितान्यमूनि **पद्यानि गणपतिमहाराजस्याज्ञां प्रवर्तियता परां सुचरितानि**

## GENEALOGY OF THE KĀḌAVAS.

**463/21—Tiruveṇṇainallūr.**
**74/18—Vriddācalam.**

**The Kāḍavas.**

**1. Valandanār *alias* Kāḍavarāyar.**
|
**2. Āṭkolliyār *alias* Kāḍavarāyar.**
|
- **3. Eḷiśaimōgan Kāḍavarāyan who conquered the 4 quarters.**
- **4. Araśanārāyaṇan Kacciyarāyan.**
  |
  **5. Araśanārāyaṇan Āḷappirandān Vīraśekhara *alias* Kāḍavarāyan (who destroyed Kūḍal in Śāka 1108 = 1186 A.D.)**

**Mōrijona—178/21.**
**Atti—296 of 12.**
**Tirukkaḷukkuṇram—187 of 1932-33.**

**5. Kūḍal Āḷappirandān, *alias* Kāḍavarāyan.**
|
**6. Pallavaṇḍār *alias* Vīrar vīran Kāḍavarāyan who conquered Toṇḍaimaṇḍalam (B. of Śēvur)**

**Munnūr—63/19.**
**35th year of Kulōttunga III.**

**6. Kūḍal Āḷappirandān Aḷagiya Pallavan *alias* Kāḍavarāyar.**

**Tripurāntakam 197/05.**

**6. Jīya Mahīpathi married Sīlāvati.**
|
**7. Maharaja Simha Avanyavanasambhava Niśśankamalla, Sarvajña Khaḍgamalla**

**Tiruveṇṇāmalai—517/02 & 480/02.**

**Aḷagiya Śīyan (?)**
|
**7. Sakalabhuvana Cakravartigaḷ Kāḍavan Aḷagiyaśīyan Avani Āḷappiranḍān Śrī Kōpperunjiṅga dēvar Niśśankamallan, Mallaivēṅdan, Pallavar Perumān, Kaḷar Kāḍavan, Bharatam Vallān, Vāḷvalla Perumāḷ, Tamiḷnāḍu**
|
**8. Kāḍavakumāran. Kāttha Perumāḷ.**

# SUMMARY OF WORK DONE

By

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*from October 1935 to September 1937.*

A detailed study of a few fundamental problems associated with the design and making of lenses and lens-combinations has been undertaken and continued during the period under review. One of these problems of great importance is the variability of the axis of a spherical surface during the process of polishing and figuring. It is quite essential that suitable methods must be developed to control this change and to make the geometrical and optical axes coincide in the case of a lens. Any want of coincidence between the two will give rise to grave defects in the formation of images. This effect will be magnified and will become predominant when we are concerned with systems which usually have more than one lens. To examine this problem a large scale working is needed if the conclusions are to be of any value, since the effect at best will be only small. In view of this, work on a speculum disc of 24″ diameter of specially annealed crown glass was started. A machine capable of taking up this disc was also designed and erected for this work.

This machine has got its special features which will meet the requirements of the main problem under study. The testing of the disc could be done conveniently from vertically above and at the centre of curvature. With special fittings which have been made, all the usual tremors and vibrations that are quite common in a busy laboratory have been got over, and any small changes of the direction of the axis could be observed and recorded.

Before starting work on the disc with machine, repeated optical tests lasting for over a month were done on it so as to make sure that it was quite free from any strains due to bad annealing. The test consisted in mounting the disc between crossed nicols and observing through the analyser whether there is any restoration of light. A visual study could not bring out any satisfactory and definite conclusions and hence photographic methods were resorted to. This necessitated in exposures lasting for at least eight hours. Due to the want of a dark room of sufficient size in the laboratory

which would admit of the crossed nicols being placed at a distance of about 40 feet between, the work had to be conducted in the long corridors only during nights. Mechanical supports at the bottom of the disc gave rise to new strains which were eventually got over by a special method of supporting on a wide thick belting. A preliminary surfacing and edging of the disc had also to be made before giving a curvature to the surface. All this required special extra attachments to be fitted to the machine that had already been erected.

Consistent with the size of the disc and also with the space available in the laboratory a curvature of 24′ was found most suitable for the spherical surface. This necessitated in improvising a method of making a grinding tool of the same curvature with the facilities that the college laboratory afforded. The main principles of the method, on which my modifications have been made have appeared as an article in the Journal of Scientific Instruments published by the Institute of Physics, London.

The initial operation of roughing to a radius of curvature of 24 feet occupied nearly two months time. In the first instance, a small size tool of diameter one foot was used, but the method soon proved to be having its limitation, in that there always remained a slight want of uniformity of curvature over the whole area. This was largely overcome by the use of a full size grinding tool. A very sensitive type of a spherometer was designed and used to measure such curvatures over large surfaces.

During the last stages of forming the curvature when carborundum of a very fine grade was being used as the abrasive, a slight jerky motion was observed on the grinding tool. This necessarily meant a certain amount of strain on the tool and this was traced to want of flexibility of the joint between the grinding tool and the vertical shaft supporting it. A special type of universal joint was designed and when this was used between the grinding tool and its support, the vibrations were completely got over. Perfect smoothness of working could be obtained.

The addition of the universal joint served to overcome one more important defect which was observed in the initial stages of the work. The centre of the spherical surface was found to be deviating from the geometric centre of the disc and it was found to be moving over a circle of about 1·5″ radius, concentric with the latter. This was got over partially by the addition of the universal coupling and by reducing the stroke of the tool.

The initial process of polishing was also carried out with the cellular polishing tool. But this type of polisher could not be used in the later stages of the work since as we proceed from the centre towards the edge of the polishing tool, the abration per unit area of the mirror surface will not be uniform. To overcome this defect, sector polishing tools were designed and used.

The testing outfit was set up at the centre of curvature. The Foucault's knife-edge test was conducted in the initial stages to control the figure of the surface of the mirror. By this method the variations of curvature up to a hundredth of a millimetre can be detected and measured. In the particular mirror, measurements were made at zones differing by 1″ radius, using zone plates. The value 26′-2″ at the centre had to be made to increase to 26′-2·25″ at the edge. To effect this, graduated polishers of various types were used. Over a hundred observations have been made before the final figure was obtained within permissible limits.

Further tests on the mirror based on the methods given by Hatmann have also been made. The results of these two independent tests show very good agreement and show that the figuring process has been successful to an accuracy of within half a wavelength of mean sodium light from computed values.

After the figuring of the mirror had been successfully completed, further measurements on the variability of the axes of spherical surfaces were resumed. The observations were made at the centre of curvature of the 24″ mirror. Rays of light from a point source of light after having been incident on the mirror and getting reflected almost along the same path converge to a point side by side with the source itself. Under ideal conditions, i.e. when the geometrical and optical axes coincide, the image ought to remain stationary as the mirror is rotated in its own plane. The movement or wandering of the image point is a measure of the variation of the axis of the mirror.

The movement of this image on a riseau plate has been observed for one complete rotation of the mirror. The radius of the circle which is described, divided by the distance between the plane of the image and the centre of the mirror gives the obliquity of the axis. This has been found to be 0·7° and the Astigmatic difference of foci caused by this obliquity is only a minute fraction of a millimetre.

In the above work, the methods for reducing to a minimum the variability of the axes of spherical surfaces during production have

been developed. They lie mostly in the choice of the grinding and polishing tools with the necessary manipulation of the strokes.

In discussing the relative merits of two types of grinding and polishing tools, there arose the necessity for a systematic study of the processes with a sector type of tool. This was done by working it on a 12″ short focus f/3 mirror. Its figure has also been made correct within a high degree of precision. The details of this part of the work together with those of the following items form the subject matter of the latter part of the work under report:—

(1) A note on the making of prisms for optical work.

(2) A design of Twyman Interferometer.

(3) The sputtering of large Fabry and Perot Interferometer mirrors.

(4) A variable spacing Fabry and Perot Interferometer.

(5) A vacuum chamber for aluminising small mirror surfaces.



Fig. 1. Showing sandal leaves healthy on left with flowers, etc., and spiked on right.

# THE PHYSIOLOGY AND BIO-CHEMISTRY OF SPIKE DISEASE IN SANDAL (SANTALUM ALBUM, LINN)

By

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## INTRODUCTION.

Sandalwood is a well known article of commerce and medicine. The tree is indigenous to India, its growth being mostly confined to the Deccan plateau. It is a root parasite belonging to the natural order *Santalaceae.* Its development is therefore conditioned by the host with which it is associated. In recent years, it is found infested with a disease—called *spike* from the spikelike nature of the affected leaves—which is invariably fatal, although the interval between the manifestation of disease symptoms and final death of the plant may be as long as three years. During this period, the spiked tree is a vital source of infection to its healthy neighbours. Measures have therefore been introduced to combat the spread of disease and will be referred to later. It is however of supreme interest to follow the physiological and biochemical changes resulting from the establishment of infection. It is thereby hoped to obtain a chemical measure of the differences between healthy and diseased plants. Moreover the causative agent of spike is of the nature of a virus and our knowledge of virus infections on the physiological processes in plants is quite meagre. The author's investigations on this subject are summarised here** the same having been carried out in the Biochemical Laboratories of the Indian Institute of Science, Bangalore.

## CHEMICAL COMPOSITION OF SANDAL IN HEALTH AND DISEASE.

Spike disease in sandal is characterised by distinct and well defined symptoms, such as reduction both in the size of leaves and in the internodal distances as can be seen from Fig. 1. The affected

** The present contribution summarises the thesis bearing this title, submitted by the author in 1934 to the University of Madras for the Degree of Doctor of Science, and subsequently accepted by them.

part of a tree does not produce any flower, and the ill-formed seeds sometimes obtained, do not germinate at all. It was found in the course of these studies that the physical changes noted above were parallelled by similar abnormalities in the chemical composition of the different tissues summarised below. (11, 12)*

CHEMICAL COMPOSITION OF SANDAL.

(Expressed as per cent. on dry weight)

| Part of plant examined | Total Ash | | Calcium | | Total Nitrogen | | Potassium | |
|---|---|---|---|---|---|---|---|---|
| | Healthy | Spiked | Healthy | Spiked | Healthy | Spiked | Healthy | Spiked |
| Leaf | 15.42 | 8.64 | 2.55 | 0.60 | 1.92 | 2.41 | 1.82 | 1.25 |
| Stem | 6.74 | 4.12 | 0.84 | 0.31 | 1.05 | 1.84 | 2.41 | 2.08 |
| Root | 2.42 | 1.85 | 0.35 | 0.61 | 0.85 | 0.14 | 0.61 | 0.82 |

It will be evident that the most outstanding response of sandal to spike infection relates to a highly disturbed metabolism in calcium and nitrogen, the significance of which was correlated by the ratio Ca/N which served as a diagnostic index (physiological) for the presence of disease (14). Such a simple method for detecting disease was not known before. It is interesting to observe that the abnormality in the composition of the affected roots with reference to lime and nitrogen probably indicates a differential absorption of the above elements. Similar abnormalities were noticed in the soils below spiked plants.

In the field, a more simple and ready method was worked out to identify infection based on biometric measurements, which consisted in measuring length (L) and breadth (B) of the leaf blade and also the petiole length (P) of the leaf under examination. It was found that the ratios L/B and $\frac{L+P}{B}$ ranged between 3.5—4.1. for the former and between 4.1—4.9 for the latter in the case of diseased specimens, while the corresponding values for the controls were 2.2—2.5 and 2.5—2.8 respectively. In a similar way, the

* Numbers within brackets relate to references to literature cited at the end.

distance between two successive internodes varied between 3.0 and 30.0 mm. in healthy samples, as compared with the same for diseased ones ranging from 3.0 to 5.0 mm., besides being extraordinarily regular in the latter. In this manner another index (physical) was secured to differentiate between spiked and healthy plants (14). A heavier branching of infected plants is another helpful adjunct to the field worker. Each one of these tests may not individually help to distinguish a spiked tree from its healthy neighbour but when combined together, they are infallible and agree closely with the conclusions from Ca/N ratio.

The most striking response of sandal to spike infection is manifest in an abnormal accumulation of starch in the various tissues. With the onset of disease, starch storage commences from the twigs (12, 13), and in the advanced condition of or in virulent stages of spike, the affected leaves are packed up with this constituent in the mesophyll and the parenchymatous tissues. In the healthy plants on the other hand, starch content is conditioned by their physiological state such as vegetative or reproductive phase and also by environmental factors. This accumulation of starch in spiked plants appears to be due to a deficiency of lime as indicated above. Sufficient evidence was adduced on this aspect based on the investigations of Boehm (1), Raumer and Kellermann (8), Grafe and Portheim (3) and recently by Nightingale and others (7). The mechanism of starch formation is however, still obscure.

The sugar content of spiked leaves at different stages of disease is of considerable interest. In incipient condition of spike, there was not much variation in this component between diseased and healthy specimens (12). With the progress of disease, soluble sugars also are higher in the infected samples (11). It is thus a problem to correlate in a satisfactory manner, the heavy accumulation of starch with increased sugars if one considers also the unusually high diastatic activity in spiked leaves, even though a spiked plant may be considered to be in a state of 'fever'! It was found that diseased leaves contained a lower fatty matter (both light petrol and ether extractable portions) than the corresponding controls. Since fats arise from carbohydrates, a reverse process was assumed to explain the high sugar content of spiked specimens. Moreover, the free acid value of such extracts was considerably more in the diseased samples. No attempt was made to identify the nature of the acidic constituent nor to test the presence of glycerin (from decomposed fats).

Similar abnormalities have been noticed with reference to organic acids, tannin and protein contents of leaves under the influence of spike. With the onset of disease, the acid make-up of the affected leaves was found to be mainly due to malic, greater in concentration than in the controls, while oxalic acid was considerably less in spiked cases. In advanced stages of disease, succinic acid was shown to be exclusively present, while oxalic was less as before (18). This diminution in oxalic acid is probably accounted for, by the poor lime content of spiked leaves (11), but the transformation from malic to succinic is still a puzzle. It was however of some significance to record the presence of an active deaminase in such tissues which would explain the production of this acid (22).

The nitrogen content of sandal under the influence of spike disease is greatly augmented in the foliage (13). This increase of nitrogen in leaves and twigs was traced to a mobilisation of this constituent from roots, which had very low nitrogen. (Table I). This is in striking contrast to what was noticed previously with regard to calcium. The make-up of nitrogen compounds in health and disease is distinctly varied. Thus, while the water soluble nitrogen, representing probably the non-protein fraction is greater in the affected specimens, in the controls protein nitrogen is predominantly present. It is possible that a greater degradation of proteins takes place with the onset of infection. An increase in ammonia content also was recorded, the cause of which was traced to the existence of a deaminase acting upon some of the free amino acids which are found to increase with the progress of disease.

Spike disease was further shown to be characterised by a higher tannin content of the leaves (15, 16), the nature of their tannin being different from that of healthy ones. The reactions tested with aqueous extracts of leaves revealed the interesting feature that while healthy specimens contained catechol type of tannins to a large extent, under the influence of disease, pyrogallol variety was predominant. All the same the controls also reacted feebly to pyrogallol type in much the same way that spiked leaves reacted feebly to catechol type of tannins. Although nothing of greater significance was indicated by this, subsequent work has thrown considerable light on the influence of these in the metabolism of sandal. The pyrogallol type of tannins detected in spiked leaves may be correlated with the abnormal oxidase activity, since the juice darkens on exposure (13). The conversion of the catechol group in healthy specimens to the pyrogallol type under the influence of infection has not been determined.

EXAMINATION OF TISSUE FLUIDS OF HEALTHY AND DISEASED LEAVES.

In order to obtain further information on the disease, an examination was made of the sap derived from various tissues, since the nutrients both from the soil and from the leaves are transported through such juice to the different organs. In all cases, only the gross juice has been studied, as it is not possible to derive the cell sap. In the present instance, a study was made of the osmotic concentration which increases with the advance of spike. The mineral composition as determined by conductivity measurements decreases in value with the progress of infection. It may therefore be roughly indicated that the diseased tissue leaf fluid is rich in organic components such as sugars, etc. In all stages of disease, the conductivity values of the juice were correlated with the ash content of the corresponding leaves (10,12).

The most significant feature of disease is manifest in a highly disturbed acid reaction of the juice, commencing with a fall in acidity (12). With the advance in spike and in virulent stages of the disease, the reaction becomes more acidic (10) being traceable to the exclusive (?) presence of succinic acid in the leaves. Titration with the leaf saps for determining the buffers in them, indicated that this abnormality is not mainly due to the free acid alone. Thus, while the high alkali requirement of the spiked leaf sap may be explained on the basis of the initial pH value alone (4.60—4.90), the course of titration is not identical when allowances are made for the volume of alkali necessary to bring the diseased leaf juice to the initial acidity of healthy one (pH 5.30—5.80). In other words, the buffer capacity of healthy and spiked leaf juices varies at different pH intervals. Thus, the buffer indices for pH ranges, 5.5—6.0, 6.0—7.0, and 7.0—8.0, were 0.031, 0 026, and 0.034 for healthy specimens and 0.017, 0.028 and 0.050 for spiked ones. When titrations were carried out with acids to determine the basicity of the juices, abnormalities were again noticed. The volume of acid (N/10 Sulphuric) required to shift the pH by 1.20 units from the initial reaction varied between 7.0 and 10.c.c. for healthy specimens while correspondingly for diseased ones, the volumes were between 2.0 and 5.0 cc. Again in a case where the initial reaction of spiked and controls were pH 4.80 and 5.40 respectively, the amount of N/10 alkali to bring the former to that of the latter (5 cc. of the juice being employed) was only 0.80 cc., while in the reverse process the volume of N/10 acid required to bring the initial pH of the healthy sample to that of the diseased one was 2.20 cc. This conclusively proves that spiked leaf juice is poorly buffered (18). It seems probable that in the infected

condition the buffering capacity is not due to an ampholyte such as protein, which is in fact less than in the controls. Further, the phosphorus content of spiked leaf juice is higher than that of the controls, and exists chiefly in the mineral form (60% of the total P). In healthy specimens on the other hand, the same exists in the organic form, as phosphatides (60% of the total P) (18). To what extent the buffering capacity of sandal in the infected condition is conditioned by all of these, has not been determined.

### INFLUENCE OF SEASON ON HEALTHY AND SPIKED SANDAL.

In view of the divergences in composition of healthy and diseased sandal, it became of interest to ascertain the effect of season on the progress of spike. It may be remarked that changes in external factors such as rainfall, temperature, and even soil conditions have little effect on the course of disease in a plant (12). While sandal normally has two seasons at which it puts forth a fresh flush of foliage, the spiked tree evinces vegetative development throughout the year till it dies. Again, while the healthy sandal tree produces flowers and fruits twice a year, the diseased plant has its reproductive phase entirely inhibited. Therefore, the variations observed in the infected cases are mainly traceable to the infective principle. Further with the onset of spike, the plant severs its haustorial connections slowly and steadily, and ceases to be a parasite (13). The age of sandal has nothing to do with its capacity to be invaded by spike. Since plants of all ages are known to be spiked and since these die during a period of less than 3 years, it appears that the age of the infected host is far less important than the period that has elapsed from the date of manifestation of disease symptoms.

### METABOLIC PROCESSES IN HEALTHY AND SPIKED SANDAL LEAVES.

In this section photosynthesis, respiration and some enzymes relating to metabolic activity of the leaves are considered. No direct evidence has been presented on the photosynthetic action of the diseased specimens. While maltose can be micro-chemically detected in healthy specimens at all times, it was found to be absent from diseased ones (13). The increase in sugar content of spiked samples could be traced indirectly to the breakdown of fatty material originally present. The absence of chlorophyll in advanced stages of disease would also point to a poor photosynthetic activity of such specimens.

On the other hand, respiratory action is greatly increased with the onset of disease. This would appear to result from the

higher amount of sugars and non-protein nitrogen present in spiked leaves. Carbon dioxide production is diminished in cut shoots with leaves. Again, tender shoots of spiked plants respire per unit weight more carbonic acid than the corresponding mature ones on the one hand and than the controls (18) on the other.

With regard to enzyme contents, diastatic action of spiked leaves was examined, the greater activity recorded by Sreenivasayya and Sastri (9) being confirmed. The experiments of Coleman (2) relating to translocation diastase (from experiments carried out at 50°C.) were repeated in view of the low amylase content reported by him. The results established a high amylolytic action of diseased leaves as before, but an inhibition of this activity at high temperature was also recorded. With healthy ones, there was a significant increase in diastase with rise in temperature. On the evidence of Green (2) the translocation of starch may be considered to be slightly inhibited because of the comparatively weaker action of amylase of spiked leaves.

A more outstanding feature of the enzyme content of diseased leaves related to the discovery of deaminase (22) in them. By this means, it was possible to account for the formation of succinic acid and for the increased ammonia content of spiked leaves. Earlier investigators advanced the view that the greater production of ammonia in such cases should be traced to a process of denitrification for which no evidence was however adduced.

The observations recorded in the foregoing sections are highly interesting, in that the primary reaction of the sandal plant to spike infection is visible in a disturbance in the calcium metabolism of the different parts. Although a few of these, such as starch accumulation, higher nonprotein nitrogen, diminution in oxalic acid, increased diastatic activity, etc., can be traced to a deficiency in lime, evidence is lacking that the other important features, viz., succinic acid formation, presence of deaminase etc., are also induced under similar conditions. With regard to spike disease however, lime has been found to play a very important part in that, the predisposed plants have an abnormally high lime content in their foliage. Moreover, manuring with lime of plots containing healthy and diseased sandal, has not tended to diminish the incidence of infection in them. It was also shown that the soil below the diseased plants had a far greater lime content than that below healthy ones.

## Studies in the Control of Spike Disease in Sandal.

In this the last section of the thesis, the results of a detailed study are presented to show that two factors are primarily responsible for the dissemination of spike in nature, even though our knowledge of the carrier of infection is yet obscure. In view of some assertions made that the disease is not infectious in character, but arises only out of unfavourable associations (being a parasite) (4, 5), evidence was adduced to show that mortality in sandal in areas infested with and free from spike varies widely. In the former case, death of sandal is heavier and there are several instances where areas have been wiped out when infection had assumed epidemic proportions (20). Thus, the presence of diseased sandal ensures the spread of spike. The other factor relates to the fact that the invasion of lantana throughout the country within the last few years has been responsible for bringing the climax type of vegetation into a scrubby one, with the result that supply of nutrition to the parasite through adequate hosts is limited. In this way, sandal is weakened and rendered more susceptible to infection and to insect attack.

The problem of controlling spike disease is thus a moot one, if the supply of this valuable species is to be kept perennial. Some preliminary experiments had shown that mechanical removal of diseased plants in an infected area (primary attack) would arrest the spread of infection, if the same were promptly carried out. With a view to ensuring thoroughness in eliminating the source of infection, *viz.*, spiked sandal, besides reducing the cost of such operations, different poisonous chemicals were tried. Of the tree-killers generally known, only the arsenicals were found to be the most potent (21). Since the preparations on the market were not uniform in their action, being conditioned by several factors, a simple preparation with a suitable method of applying the same correlated with the size of the plant was finally evolved. This procedure has since been widely adopted with a large measure of success.

An interesting outcome of the above experiments on spiked sandal was to find out if the therapeutic value of the oil and of the scented wood was affected by this otherwise valuable treatment. It was shown through elaborate investigations that the heartwood contained a very small proportion of arsenic (40-320 p.p.m.) through arsenicals applied. On the other hand, the oil did not contain any arsenic, no matter whether the same was deriv-

ed by the steam distillation or the solvent extraction methods. The procedure for the estimation of arsenic in oil was checked against a known amount of the poison added to it and recovered in full by analytical methods (19). The major part of arsenic applied to the tree was absorbed by the bark and sapwood portions only, which showed a gradient with reference to this component. In this way, the application of arsenicals to control spike disease was shown to be an innocuous procedure.

In regard to lantana, the problem is even more complicated. Although it is a shrub, it grows to a height of even 10 feet under favourable conditions. It is also a thorny bush, spreading so rapidly that it cannot be controlled by a single process (17). The removal of the existing crop is thus a problem of vital importance. As a result of extensive studies, it was found that sodium chlorate acted effectively in destroying the growing plant. The method of application had to be modified depending upon the size of the crop. To effectively eliminate this species, it was necessary to make available within the plant ½% solution of this chemical. Arsenicals were also shown to be potent. A more important aspect of the problem is to adequately control the millions of seedlings that arise when the existing cover is removed. For this purpose, thiocyanates were successfully applied. The question of controlling the viability of the seeds lying dormant in the soil through similar simple treatments is yet to be considered. Lastly, the ecology of lantana has yielded a clue to the factors that favour the growth of this exotic, and it does not appear possible to check its spread through cultural treatments alone.

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# "THE CARNATIC MUSIC COMPOSERS"

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## PREFACE.

The title of the work is given as "The Carnatic Music Composers." It mainly deals with the composers of the Vedic period, the Ancient Dravidian period, the Medieval and the Modern periods. It is intended to be a survey of the history and the valuable contributions of the prominent composers of South Indian Music. This represents the research work conducted by me under the auspices of the Madras University, from August 1934 to August 1936, under the superintendence of Sangita Vidwan, Tiger K. Varadachariar. This is a compilation of all the available authentic and traditional information got from various sources, regarding the composers into one succinct, detailed, and consolidated account, which is rather quite necessary for one to appreciate and really enjoy the masterly compositions.

The true purpose of music lies in its power to stir our emotions. This cannot be attained without that sympathy with composer which alone would guide one to the correct understanding of his motif (कविहृदय). Hence it is necessary to know something of the lives of great men who have consecrated their genius to embellish noble feelings through their artistic creations. Though they have left behind a rich legacy of thousands of compositions, it is a matter of regret that neither the modes and styles of the Artists, nor accounts of their lives have been preserved in their pristine purity. There are evident reasons for this draw-back. The art of music has generally been in the past in the hands of some selected people and not accessible to all. Moreover, the rarely cultivated art of writing, the compulsory method of preserving information on Cadjan leaves, the lack of a common notation, the professional jealousies preventing a smooth and loving broadcast of knowledge and the easy going and the conservative lives of those days, all these are sufficient reasons. But we are not completely in the dark. For, the time honoured "Gurukula" system has come to our rescue in preserving the valuable creations

of the master minds and their history in the shape of hereditary accounts handed down through its long unbroken chain of disciples.

With the permission of the University, a tour was undertaken to many important places in the Southern Districts. This enabled me to collect materials from the living descendants of some of the composers, and also from old records and manuscripts.* Besides this, many music scholars residing in the City, supplied me with valuable notes. My grateful thanks are, therefore, due to those persons in and out of Madras, who were of great help to me in the compilation of the thesis on "The Carnatic Music Composers."

## INTRODUCTION.

Since the subject is too comprehensive to be studied as a whole, it is dealt with under three main periods, (i) The pre-Jayadeva Period.[1] (ii) The early post Jayadeva period and (iii) The Modern period. The first extends from the remote Vedic period up to Jayadeva's (11th century); the second runs from the 12th century down to the 17th century, i.e., up to Venkatamakhin (17th century); and the 3rd, the modern period is taken to commence from his date.

In order to appreciate the nature and value of the compositions that enrich the music literature of South India, it will be necessary to study the various kinds of musical compositions[2] existing in our music. Hence a classification of the compositions is annexed in Appendix No. I.

Since the creations of many master-artists comprise of all kinds of compositions, it is more convenient to make a chronological study of them rather than to classify them according to the kinds of compositions. So, in each period, an account of the composers that flourished during the time, and their valuable contributions, is given, in a chronological order. I have tried, as far possible to ascertain the exact dates. In certain cases, however, only the century of the composer and in some other cases, only the upper and lower limits of the date could be given.

* For a detailed account of the tour see pages 3-7 of the complete thesis.

1. For, the history of musical composition can be regularly traced only from Jayadeva (11th Century).

2. For a detailed study refer to the introduction of the original thesis, pages, 12-19.

## THE PRE-JAYADEVA PERIOD OR THE ANCIENT PERIOD.

"The unqualified testimony of Oriental scholars has long marked India as the cradle of Arts, sciences and literature, at a time when other nations scarcely emerged from the rudest state of barbarism."...As a country which affords us the most ancient memorials of a perfect language, of an advanced civilization of a philosophy where all directions of human thought find their expression, of a poetry immensely rich in every style, it was no less remarkable for a "Musical art corresponding with the lively sensibility of the people." Our Hindu sages long before knew the origin and relationship of musical sounds and employed Vedic hymns to accompany the sacrificial rites. These hymnal chants differ in their modes of recital according as they belong to the Rik, Sama, Yajur and Atharva Vedas... This period is roughly known to be 4500 B.C. Of these, the Sama Veda contains the major portion of the text from the Rig Veda, only altering or expanding words so as to make them suitable for chanting and also much of the grammatical and prosodical terminations of the Rigveda have been given in the Samaveda, a musical meaning.

There seems to be different systems of music in the Vedic period as seen from such assertions made in the Rigveda like "Archiko gayanti" (अर्चिको गायन्ति) "Gāthino gāyanti" (गाथिनो गायन्ति) and "Sāmiko gāyanti" (सामिको गायन्ति) The "Svarāntara" (स्वरान्तर) system seems to be a later addition. This was naturally developed into the "Svara saptaka" (स्वरसप्तक) system on which the science of Indian music is based. The seven svaras are mentioned in the Vedangas, echandas, and sikshas. The Upanishad (600 B.C.) make mention of the "Sapta svaras," and the three-fold classification of music into "Gita," "Vādya," and "Nritya".

The Ramayana was composed in 500 B.C. by which time Indian music was sufficiently developed so as to gain an independent position and an indispensable aid to poetry. In it is mentioned that Sage Valmiki, the Adi Kavi, taught the sons of Rama the science of vocal and instrumental music and made them sing the praises of their illustrious father. The music is described as melodious, with variations, not only in the three kinds of movements, 'Druta,' Madhya and Vilambita, but also in seven different "jātis" (जाति[1])

1. The "Jātis" according to the specimens of "Gitas" given in the "Sangita Ratnakara", are the results of transposition of Notes (Svaras). This transposition must have been the basis of the later Raga System.

17

the equivalents of the modern "Ragas." Valmiki displays his rare knowledge of music in describing the music at Bharatwaja's banquet.[2] The music to which the Epic was originally set, is unfortunately lost to us now, but the style of Valmiki is by itself musical; exquisitely beautiful, as it is, to the eye in the combinations of form and to the ear in sweet strains of melody born in words. The Mahabharata also teems with references, worth noting, of music and musicians in the service of the Pandavas and the ruler of Virata.

Side by side with the Aryans, the Ancient Dravidians of South India, also developed their independant system of Music. In fact the latter seems to be the most ancient one. It was during the 1st Sangam Age about 8,000 years back, the classical works [3] on the art of Music were written. There were composers and poets like, Kannaganar, Kesavanar, Nallachutanar and Naganar, who wrote many musical compositions. The "Silappadikaram" gives valuable information on the theory and practice of music and dancing and contains intrinsic truths which were ages afterwards discovered and which almost agree with the present system of Carnatic music. Tamil music must have been maintained at such a high level only by the patronage and encouragement of the Pandya kings up to the last Sangam age. Later on, from the 2nd century a dark age followed with decline in love and patronage of the art, probably down to the 7th century.

The beginning of the 7th century saw the second epoch in the revival of fine arts, especially Music, contemporaneous with a similar epoch in the religion of South India. The advent of the Saivite saints was the dawn of religious music. Their voluminous hymns which have come down to us as the "Devārams," were all composed between the 6th and the 8th centuries. They were later on compiled into eleven collections or 'Tirumurais திருமுறைகள் in which form they are now popular, by one Nambi Andar Nambi at the instance of Raja Raja Abhaya Kulasekhara Chola of Tanjore.

Among the composers of the "Devāra Hymns," Tirugnāna Sambandar decidedly takes the foremost rank ; his colleagues Appar and Sundarar, invoke his aid at the commencement of their works. He is assigned to the middle of the 7th century. Early initiated into the "Wisdom, Divine", he grew to be a poet and composer and visited most of the Saivite Shrines in South India, singing the praise of the presiding Deities of those places. As a poet and com-

2. Ramayana of Valmiki, Ayodhya Kanda, Sarga 91, Slokas 26-27.
3. Perisai, Sitrisai, Isaimarabu, Isai nunukkam, and Silappadhikaram.

poser, Sambandar has more than ordinary claims to be remembered. His hymns are models of pure and elevated diction, generally earnest and touching but always melodious and enchanting. All of them, being lyrical, are set to music. The original tunes are now mostly forgotten. They were lost into the later 'airs' introduced by the Aryan musicians. Some of the old names [4] are retained still.

Tirunāvukkarasar or Appar is an elder contemporary of Śambandar. His hymns sound a note of earnestness and pathos but they are lucidly simple and hence finely adapted to music. They also give some biographical references, here and there. Sundarar, the last of the Saivite Saints has contributed much to the Devāram collections. He belongs to the 9th century, A.D.

"Mānickavāchakar" is another great name in the world of Saivite hymn composers. No work is held in such estimation and veneration by the Tamils as his "Sacred song" (Tiruvāchakam). A prime minister of the Pandyan King, Arimardana, he turned an ascetic by the influence of a Divine preceptor and went forth singing melodious strains. The music of his melting hymns and their glowing faith and fervour have for centuries continued to thrill the emotions of the millions of Tamil people. Historians are at variance with regard to his date. Tradition places him earlier to the "Devāram Composers". English readers can find plenty of information about him in Dr. Pope's translation of his work.

Even as the Saivite Singers spread their cult through their emotional hymns, their contemporaries, the Vaishnavite Singers too spread their own. Their contributions have been handed down to us in the shape of the "Nālāyira Divya Prabandham," a collection of 4000 hymns. They seem to be composed between the 5th and the 9th centuries. They were collected together by Nādamuni (920 A.D.).

Biographical information about the composers, has been made available to us both from external and internal sources. The hymns still continue to maintain their original spirit, in the Vaishnava circles. People memorising them, chant them to simple ragas or tunes in temple worship and religious functions. Here again, the original modes are not known, but, are replaced by simple modern ones.

4. Kuranji, Kolli, Thakkēsi, Chevvali, Puranirmai, Nattapadai, Gāudhāram, Sādāri, Kausikam, etc.

## THE EARLY POST-JAYADEVA PERIOD

After the 9th century up to the 12th, for a period of three hundred years we are in the dark regarding the history of Musical Composition, which can be traced continuously only from the latter part of the 11th century during which Jayadeva, the composer of the "Gita Govinda"[5] flourished.

Jayadeva hails from Bengal, his native place being known to be a village by the name "Kindubilva" or Kendula किंदुबिल्व which is located in the District of Birbhum. He gives his parentage in the last sarga of his work.[6] He also refers to some of his contemporaries who were great poets, at the beginning of the 1st Sarga[7].

It is traditionally maintained that Jayadeva flourished in the court of Lakshmanasena, ruler of Bengal.

This is corroborated by an inscription found engraved[8] in the court of Lakshmanasena, on a stone above the entrance hall. Historians have determined the date of the Bengal ruler to be 11th century. Thus Jayadeva's date can be fixed in Circ. 1100.

Jayadeva was a staunch Devotee of Lord Sri Krishna. His life as narrated in "Bhaktimāla" of Sri Chandra Datta, bears testimony to this fact. Many legends are told in this book, of his devotion to Sri Krishna who himself aided him in describing the loveliness of Radha when his mortal powers failed. His life was one of pure devotion and propitiation of his Lord with his songs accompanied by his devoted wife Padmāvati.[9] Even now in the annual festival held in honour of Jayadeva at his native village in

5. The collection popularly known as "Ashtapadis".

6. श्रीभोजदेवप्रभवस्य रामा[धा]देव सुतःश्रीजयदेवकस्य......

7. उमापतिधर (Umapatidara), गोवर्धनाचार्य (Govardhanacharya), शरणः (Sarana), धोइ कविराज (Dhoyikaviraja).

8. The Inscription:— गोवर्धनश्च शरणो जयदेवो उमापतिः ।
कविराजश्च रत्नानि समितौ लक्ष्मणस्य च ॥
(From the Introduction to the Kavya, Nirnaya Sagar Edn., by Mangesh Ramakrishna Telang.).

9. In the introduction to the work, the composer refers to himself as पद्मावतीचरणचारणचक्रवर्ती (Skilled in conducting the feet of Padmavati in the course of her dance.).

Bengal, the entertainment is said to consist of the representation of the "Gitagovinda" together with Jayadeva's songs.

The "Gitagovindam" is one of the classics of Sanskrit and devotional poetry and above all, the earliest available musical Opera, with a continuous tradition of popularity extending over seven centuries. The songs possess a fervour and sweetness that appeal alike to "Rasikas and devotees." The prime quality of his style is sweetness. It is but natural in a poet whose devotional fervour was exercised in realising God by the 'Madhura Bhava' मधुरभाव....... "The songs excel others in all the qualities that go to make music in words, even without their being set to tune with instrumental aid. However, the composer has assigned to each poem, its definite Raga and Tala. But the notation has not been given or preserved nor are the songs sung in the same original Ragas assigned to them. The original tunes are now lost to us. Even the commentator of the "Gita Govinda" Kumbha Nripati of Mewar and author of "Sangita Rajam," gives only the tunes which, he says, were adopted in his time.[10] In the North, they are sung in different tunes in different places. While in South India, they have come down to as in their popular name "Ashtapadis." Perhaps they were popularised by pilgrims, musicians and devotees and sung in purely carnatic tunes.[11] Tradition tells us that during the last century one Ramudu Bhagavatar of Tirumalairajanpatnam, a musician under the patronage of the then pontif of the Kamakotipeeta, set them to the South Indian Ragas.

The importance of the work is brought out by the facts given below. Firstly, it is the earliest available musical composition in the form of an Indian Opera though conforming to the early rudiments of Sanskrit Drama. Besides the Devara hymns the only music still surviving amidst us, in the form of verses at least are the 'Ashtapadis' of Jayadeva. The fact that it is essentially a musical composition is testified by the poets' own words in the conclusion of his work :—

यद्गान्धर्वकलासु कौशलमनुध्यानं च यद्वैष्णवम्

... ... ... ... ... ... ...

सानन्दाः परिशोधयन्तु सुधियः श्रीगीतगोविन्दतः ॥

10. (1433-1468 A.D.).

11. All popular tunes except some unfamiliar ragas like पण्ठा मङ्गलकौशिक and देशाक्षी

As the songs are sung alternately by one or other of the three personages—the Nāyaka, Nāyaki and Sakhi........with effective representation of their sentiments and feelings, they are best suited for "Abhinaya." This is attested by the fact that the "Gita Govinda" is rendered in "Abhinaya" in the Tamil country and we have in the Tanjore Library a commentary on the "Gita Govinda" which gives "Abhinaya" word for word. All these, no doubt, are based on Bharatha's Natya Sastra.

Lastly the songs claim an important place in the realm of 'sacred music' and are sung throughout India. There is no "Bhajana" in which the "Ashtapadi" hymn usually followed by one "Taranga" तरङ्गम् of Narayana Tirtha, is not sung. The songs had attained such a wide popularity that many subsequent writers composed words on the same model choosing parallel themes.

Hitherto the 'Ashtapadi' hymns were available in print only with the bare text. Some writers of music text books, however, rendered one or two of the hymns into notation. But the music world of to-day is indebted to the late Mr. C. R. Srinivasa Iyengar for his scholarly edition of the "Gitagovinda" published recently with important and valuable notes and with all the 24 "Ashtapadis" set to carnatic tunes handed down traditionally to us.

(Notes about some of the prominent composers who wrote works on the model of the "Gitagovinda" are given in the Appendix No. II.).

### THE TALAPAKAM COMPOSERS

The Tālapākam musicians are found to be the earliest composers of "Kirtanas" mostly adopted in the "Bhajana Paddhati" after Jayadeva of the North. Their date ranges from 15th to 16th Century.[12] Talapakam is a village in the taluk of Rajampet in the Cuddapah District. It was one of the many villages given as endowments to the Tiruppati Temple by Krishna Rāya (Tuluva line) who reigned in Vizianagaram from 1513-1531 A.D.

12. Inscriptions about the composers are found recorded in the "Sasanas" in the possession of the Archaeological Dept., Tiruppati Devasthanam, which has already published their discoveries in 2 vols. Mr. P. K. Vijayaraghavachariar, the Archaeologist, was engaged in the publication of the Talapakam composer's works in the Mahant Press, G. T., Madras, and the publications may be available for sale now.

The Tālapākam musicians were 'Nandavarika' (Nandavaideeka) Telugu brahmins and[13] Annayarya is the eldest member of the family. Annayarya during his early life transferred his native home from the Tālapākam village to Tiruppati where he was initiated into the Vaishnava faith. As he was a wonderful composer of 'Sankīrtanas' and a scholar in the "Drāvidagāna" of Vaishnavas, the "Nālāyira Divya prabhandam', he was honoured with the titles:—'Sankirtanacharya' सङ्कीर्तनाचार्य and "Drāvida gāna Sārvabhauma'. द्राविडगानसार्वभौम

Annayarya is the author of the following works:—(i) 'Adhyātma Sankirtanalu', (ii) "Sringāra Sankīrtanulu" and (iii) 'Sringāra Manjari'.[14] The exact date of the commencement of the works is given in the prologue as Sakha 1345, (Krodhi) (1424 A.D.), the 16th year of the poet and he continued to compose till Sakha 1424 (1503 A.D.). Thus for a period of 79 years, he was engaged in his compositions which he sang before the holy Lord of the Seven hills and lived up to his 95th year.

The theme of the "Adhyātma Sankirtanulu" is the inculcation of Bhakti and insistence on the adoration of Sri Venkatāchalapati. The 2nd work is all addressed to the Lord as the Nāyaka while the composer himself is the Nāyīka (lady love). The 3rd deals with the love of a maiden for God Venkatesa and its consummation through the intercession of her companions.

### PEDDA—TIRUMALAYYANGAR

He is the son of Annamarya and the author of (i) 'Sringāra Sankirtanulu', (ii) 'Vairāgya vachana mālika gitamulu', (iii) 'Sringāra Dandakamu', (iv) 'Chakravala Manjari' and (v) 'Sringāra Vrittapadyala Satakamu'. The first 3 works closely follow the style and contents of those of his father. The composer calls himself by different names, as Timmayya, Tirumalaraya, Pedda Tirumalācharya, etc.

*Chinna Tirumalayyangār* alias Chinnayya is the son of Pedda Tirumalacharya. He wrote the compositions; (i) 'Adhyātma Sankirtanulu', (ii) 'Sringara Sankirtanulu', (iii) 'Ashta-Bhasha Dandakamu', and (iv) 'Sankirtana Lakshanamu'.

13. Other names by which he is referred to: Annamarya, Annamacharya, and Annamaiengar.

14. The above compositions, along with the other works of the successors in the family, were found preserved in about 3,000 copper plates which were found in tact in a small room in the temple of Sri Venkateswara at Tiruppati.

The first two are in tune with those of his grandfather. "His 'Sankirtana Lakshanamu' written in Telugu verse, treats of prosody and describes the compositions of Sankīrtana in different metres and styles, prose poetry, psalms and songs and purports to be a telugu rendering of the "Sankirtana Lakshanam" in Sanskrit written by his grandfather. Besides these, Chinnayya has composed Kīrtanas for 'Utsava-paddhati'; such as those for 'Toḍaya-mangalam' 'Hecharika', 'Dūpa-dipa Naivēdya,' 'Vasantotsava,' 'Dholotsava' and other devotional songs pertaining to Bhajana which are even now sung with due pomp and ceremony at the shrine of Tiruppati.

Even now the descendants of the Talapakam family follow the footsteps of their fore-fathers in their regular worship of the Lord at Tiruppati and conduct Bhajanas, still enjoying the many munificent gifts of lands given to the devotees by Sri Krishna Deva Roya and Sadasiva Roya.

### ARUNAGIRINATHAR

*The author of 'Tiruppugazh Hymns.'*

South India has contributed to an inestimable extent to the development of Indian Religion, Art and Culture and one of the great souls that fed the torch of our religions and artistic heritage with the fire of his genius and kindled it into glowing brilliance was Arunagirināthar.

Scholars have determined the date of the musician saint to be 15th Century A.D. He must have lived in the reign of Prauda-Pratāpa Deva Roya II (1422-1449) A.D. Emperor of Vizianagar, who is also referred to in one of the hymns.

The birth and caste of this personage are both shrouded in mystery besides two or three traditional anecdotes which are quite at variance with each other. One version traces his ancestry to the Mullundrum family, originally Gauda brahmins who migrated to the South, with its tradition of eminent scholars and pandits known by the general name "Dindima Kavi" and hence entitles Arunagirinatha to the proficiency of Sanskrit and Tamil revealed in his works; while another states that he was born of a devout 'Deva-dasi' in the service of the temple at Tiruvannāmalai. He was subjected to a severe attack of leprosy and to get relief, he surrendered himself to the grace of Lord Subramanya by which he was soon rescued from the clutches of the disease and by which he came out in inspired moments with innumerable songs addressed to his Savi-

our. He undertook like all the South Indian Saints, pilgrimage to various shrines dedicated to Subramanya. Wherever he went he saw the great revelation and felt in himself to propagate the gospel of "Shanmukha Bhakti," broadcasting it through his marvellous hymns. He came to possess wonderful powers of divinity which he revealed on several occasions and homage was paid to him by one and all.

Arunagirināthar is said to have composed about 16000 hymns out of which only 1300 have come to exist as 'Tiruppugazh,' besides many other works like "Kandarandādi (கந்தரந்தாதி) Kandaranubhūthi (கந்தரனுபூதி) etc., ... all extolling in familiar metres the grace of his Lord.

With regard to his style there can be no better critical testimony than that of Saint Thāyumānavar himself. He made a deliberate choice when he employed Tamil, the language of the masses of South India, as the medium of his songs. Being a poet and a musician combined in one, he could sway the heart of the entire populace. His phrases out of an alloy of the richest Tamil and the most graceful Sanskrit, bear at every turn the touch of the master-hand. He is also styled as "Sandappāvalapperumān (சந்தப்பாவலப்பெருமான்) as he was an unrivalled master in handling the type of verse composition known as 'Sandam'. He seems to be the orignator of this kind of verse. Being also a skilled musician with a rare originality he makes many references to music, for e.g., in the "Bhūtavētalavaguppu (பூதவேதாளவகுப்பு) references are made to some 'ragas' both Dravidian and Carnatic and ancient 'Talas'.

A musical critic writes[15]:—"His amazing skill in creating a marvellous variety of rhythmic patterns in their application to music,[16] his achievement in making them subserve the practical need of the art and above all his creation of a musical style stamped with the greatness of his genius reveal to us, perhaps, the most charming aspects of his personality.

His services to music especially the Tala system, are really valuable. He must have possessed remarkable talents in this branch of the Art, as he has wonderfully employed peculiar varie-

15. Mr. N. S. Ramachandraiyyar, Avl., former Research Student in Indian Music, Madras University.

16. Instances are too many to be given as to the aptness of words to sounds and jatis to metres,—a style still unsurpassed.

ties of the 108 Tala system as well as the common system of 35 Talas.

He in fact belongs to the band of musician-Saints like Purandaradās and Tyagarāja. Like them he preached through music and condensed philosophy in songs. It is a pity that the music to which he set his hymns is not known to us as is the rest of the music of those bygone ages. But, his words set to modern tunes live and still make the heart of the hearers throb with love, hope and pleasure.

### PURANDARA DASA

The 16th Century produced a famous Carnatic Trio,—the great emperor Krishna Deva Roya[17] of Vizianagar in Politics, the learned spiritual pontif, Vyasa Roya in religion and the saintly bard Purandaradasa in the field of music who illumined the pages of Indian History. Purandaradāsa is the most illustrious of those great composers produced by the movement of Bhakti, initiated by " Madva Singers " in the beginning of the 16th Century. The earliest " Vaishnava composer in Kanarese was Naraharitirtha of Udipi Mutt (died in 1333). It was during Krishna Deva Roya's reign that Kanarese compositions had a transition. Purandaradas lived at Pandarpur in time of Achuta Roya (1530-1542, A.D.) and seems to have spent his whole life at that holy place till he left the world in 1564. Hence the 'mudra' employed by him throughout his works is " Purandara Vittala ".

He was the son of a Madva-desastha brahmin by name Varadappa Nayak,[18] who lived at the historical place known as " Purandara Gada " near Poona. Young Senappa—as he was named by his father, took up the merchant profession and as a shroff merchant attained such early proficiency in his trade of dealing with jewels and precious stones that he was soon patronised by Rajahs and nobles.

An avatar of Narada, as he is considered to be, the merchant 'Senappa' forgot his spiritual mission in the midst of monetary dealings. He was an avowed miser and avaricious money lender. He was however fortunate in having a pious and devoted wife by name Saraswati Bai by whose charitable disposition his attention was drawn to the Divine mission to which he was destined. At once he gave all his property in charity, embraced charity and went

17. Reigned from 1509 to 1529.
18. The name is a professional one for merchants.

abroad as an itinerant missionary delivering his message to the suffering humanity. He embraced the 'Madva' cult as a disciple of Vyasa Roya Swami.[19]

" He was at once an enlightened preacher, a gifted poet, a social reformer and a soul-stirring musician "....He studied and mastered Indian Music and to suit the conditions of his time, he systematised practical music by working many "Lakshana granthas", "Geetams" and "Sūlādis" (all including about 50,000 pieces) to enable the students of music to acquire the art with ease. He also composed innumerable short sacred songs popularly known as "Dāsara Padagalu" and "Devara nama."

By these compositions, Purandaradas has enriched both Kanarese literature and Carnatic music. His songs are clothed in sweet and soul stirring music. Containing lofty ideas and sentiments, they have been the delight and admiration of musicians and pandits. They appeal to all, in the living language of the day and intelligible to the pandit and the peasant alike. The figures of speech and proverbs incorporated in them are very attractive to all kinds of minds. Purandaradasa is rightly called the "*Karnātaka sangīta Pitāmaha*" for he it was, that laid the foundation for the present development of Indian music. The later musicians like Venkatamakhi, Tyagaraja and others, followed in his foot-steps and contributed a great deal for the growth of South Indian Music.

Purandaradas had five sons who were all composers of "padas" in Kanarese and who formed the 'Dāsa Kūta'. There is no religious service in any Madva mutt in which the traditional songs handed by the "Dāsa Kūta' are not sung along with those of Purandaradasa.

*Kanaka Dasa* a centemporary of Purandaradasa was born in the year 1509 in the village of Badavi in the Dharwar district of the Bombay Presidency. A shepherd by caste, his father, Virappa by name, held the position of a feudal chief in the service of the Sovereign of Vijayanagar. Young Thimmappa—so our Kanaka Dasa was named as a child —grew like a prince in a prosperous home and possessed the necessary equipments befitting the heir of a feudal chief. He had to assume office earlier as he lost his father even in his teens.

19. "Vyasaroya Swami; the founder of the well-known Vyasaroya Mutt . . . A disciple of his was Purandaradas, whose hymns are famous in South and Western India. Kanakadasa, another disciple of his was also a noted hymnologist."—(Mysore Gazetteer No. 1. Refer under Vyasa Raya).

In one of his campaigns, he came to possess enormous riches and was hence called "Kanaka Nayaka". But the god-fearing Kanaka spent them in erecting a temple on the banks of the river 'Kagini', dedicating it to Sri Adi Kesavamoorthi and endowed it richly. By nature, as he was gifted with a brilliant art of poesy and song, he began to compose and sing many hymns in praise of the Lord; wherein appeared by way of Mudra, the Lord's name "Kaginele-Adikesava Roya. But at this time he had to face a Divine Ordeal which compelled him to become God's 'Dasa' (Dedicated Servant). After many trials and temptations due to his wealth and high position, he at last found out the real significance of a "Dasa," and at once renouncing his all, he travelled far and wide with his 'Ektār' singing the praises of the Lord, his master. In the height of his devotion he poured forth verses and songs whch have come down to us with all their depth, meaning and lucidity of music.

### NARAYANA TIRTHA

Among the composers of music Operas, Jayadeva is the earliest known. In the hands of Nārāyana Tīrtha the Opera seems to have reached its highest water-mark. His "Krishna līla Tarangini" is undisputedly the best of its kind.

Nārāyana Tīrtha seems to have hailed from North. According to tradition, born of Andhra-brahmin parents near Benares, he attained early proficiency in Sanskrit lore and music and remained a true "Brahmachari" throughout his life. Taking initiation into 'Sanyasa Asrama' from Sivaramananda Tīrtha he studied Srimad-Bhāgavatam and sang the Ashtapadis of Jayadeva and thereby attained a great devotion to Lord Krishna. While he was on a southern tour, it was so ordained that he should be attacked by acute stomach-ache. Suffering very much he reached a village Nadukkaveri in the Tanjore District. From that place he was led by a miraculous-'varaha' (wild boar) which he followed by Divine order, to another village 'Bhūpatirajapuram' where it disappeared into the local temple dedicated to Lord Venkatesa. There he was again ordered by God to stay and sing His praises for the cure of his disease. Accordingly he stayed at 'Varahapuri' (now known as 'varahoor') and when he found that he was slowly relieved from the cruel clutches of the disease, his devotion grew deep and the result was the birth of the immortal work "Sri Krishna Līla Tarangini," attended by auspicious circumstances.

At the beginning of the work, Sri Venkatesa, the presiding deity of Varahapuri, is invoked.

He sang daily the songs from his work and taught the same to many disciples. As he was a master of Bharatha Natya, he also taught them the "Abhinaya" for the compositions and enacted with them the "Opera" before the Lord's presence with sincere devotion. Even now one can hear his "Tarangas" being faithfully sung by devotees during the grand festival of Krishna Jayanti at Varahoor. After living there for some time he retired to a solitary place nearby—a village by the name Thirupoonthuruthi. (திருப்பூந் துருத்தி) where he stayed in penance till he entered into samādhi. The particular day on which he merged with the Divine grace is celebrated with great eclat at that place by the few disciple belonging to the holy parampara.

The "Krishna Līla Tarangini" is one of the best Sanskrit Operas. It contains 12 cantos called "Tarangas" (waves), each of which is interspersed with songs verses and prose passages which serve as Preludes and Interludes. The songs are all "Kirtanas" in form with Pallavi, Anupallavi and many Charanas. The theme is of such a beautiful choice that it allows vast scope for the display of musical art and the allied art of dancing. A perusal of the work will reveal that Narayana Tirtha was an expert in music and "Bharata Natya." Among the 'ragas' employed he has a predilection for the 'rakti' ragas Nadanamakriya, Madhyamavati, Kedaragowla and Sowrashtra, which occur frequently. He also gives technical methods of dancing while describing the dance of the Gopis' around Krishna. Many songs are also adorned by beautiful "Solkattus" ( சொல்கட்டு ) (the language of the Mridangam), used in the art of dance.

In fact his compositions enjoy a wide popularity in South India and rank along with those of Jayadeva and Purandaradasa in the realm of sacred music.

### Bhadrachala Ramadas

The "Kirtanas" of this great devotee are widely popular in South India especially in each and every district of the Andhra Desa. The place 'Bhadrachala' or 'Bhadradri' attained fame on account of Ramadasa and Ramadasa is famous as belonging to 'Bhadrachala'.

From the history of the Nizam's Dominions we learn his parentage, birth place and religion. Belonging to the 'Niyogi' sect among Andhra brahmins, his father was one Linganna Mantri and mother Kamamma (कामम्मा) both belonging to Nela-kondapalle; their house name being 'Kancherla'.

We come to know both from the " Rāmadāsa Charitra " and tradition that he was the मेनल्लुडु (Sister's son). or nephew of the two famous brothers, Akkanna and Madanna who were holding high posts in the 'Golkonda' State. The then ruler was Abdul (Hassan Qutub Shah, the last of the rulers of 'Golkonda' (1672 to 1686-1687 A.D.). It is this person that appears as 'Tānisha.' Hence, Ramadasa may be assigned to the 17th Century.

Gopanna—later known as Ramadasa—early became a great scholar and worshipped " Sri Rama " as his family deity. He was both religious and broadminded as his uncles. It is said that the celebrated poet and devotee " Mahatma Kabir Doss " took him as his disciple and initiated him with the " Tāraka-mantra " by worshipping which his devotional fervour increased day by day.

Through the influence of his uncles, he was posted as Tahsildar for the taluk of 'Bhadrāchala." But he did not hold office long. In his rapturous devotion to Sri Rama, he spent away about 6 lakhs of pagodas from State Revenues for the purpose of renovating a dilapidated temple of " Sri Rama " in his taluk. For this offence he had to suffer imprisonment and torture for 12 years.

It was during this period of his life, in the prison, that he gave the world many of his soul-stirring devotional songs entreating " Sri Rama " to relieve him from his trouble. The story is popularly known how he was ultimately saved by the miraculous intervention of " Sri Rama ". Ramadas, as he was now called finished the work of the temple, dedicated the rest of his life in the service of " Sri Rama " and attained the abode of His lotus feet.

Even as Purandaradasa did in his country, Ramadasa was able to rouse the feelings of intense 'Bhakti' among his own country men, through his ennobling kīrtanas. Clothed as they are in mellifluous telugu and set to music more melodious, they have won such an extent of popularity that every devotee, mendicant, lady or child, knows at least a few of them. The Saint Tyagaraja pays his homage to the great Ramabhakta in his two kritis " Brindāvanalola " in Todi and " Kshīra Sāgara " in Devagāndhari.

His compositions consist of Kritis, Kirtanas and Divyanama kirtanas all in popular Ragas and Talas. Strictly speaking all of them can be included under " Kīrtanas, for the " Sahitya is predominant and there are more than 3 charanas in each. But as the language is chaste and sweet, they afford large scope for variations and display of Raga Bhava and above all, they appeal to the emotions of the hearers and inculcate " Ramabhakti."

### MARGADARSI SESHAYYANGAR

A Vaishnava Brahmin of Srirangam, he flourished during the latter half of the 16th and the former half of the 17th Century. He was a profound sanskrit scholar and musician. He seems to be the author of a number of kirtanas in sanskrit with the mudra "Kosala." Only about 60 of them became popular. As they were found to be ideal in strictly adhering to the 'Sastras' in music, the Pandits of the time honoured him with the title *Marga Darsi.* (A guide for all future composers).

Svāti Tirunāl Maharajah of Travancore, a reputed contemporary of Thyagayya, refers in one of his works,[20] to the excellence of Seshayyangar's Kīrtanas which he takes as models for 'sahitya' composition. This brings to light the high merit of the compositions, which, when restored, will surely be valuable additions to Music Literature. Some of them are even now popular.

## THE MODERN PERIOD

### VENKATAMAKHI

With Venkatamakhi commences the Modern Period in the history of Carnatic Music and Musical compositions. Venkatamakhi[21] was the 2nd son[22] of Govinda Dikshita, author of 'Sangita Sudha' and the famous minister of the Nayak kings of Tanjore, and is the illustrious author of the "Chatur-Dandi-Prakasika" one of the most valuable treatises on South Indian Music.

It is traditionally handed down that Venkatamakhi's Guru was one Tanappacharya who was a musician of Northern India.[23] Venkatamakhi was also the chosen minister of Vijayaraghava Nayak of Tanjore, under whose persuasion the great scholar wrote the "Chatur-Dandi-Prakasika" in 1660, which deals with the subjects of Veena, Sruti, Svara, Mela, Raga, Alapa, Ttaya, Gita, Prabandha and Tala. Besides he wrote also a treatise on the 72 melas

20. A small book in Malayalam treating of the science of music, still in manuscript form.

21. Also referred to by the names Venkatadhvari and Venkateswara Dikshitar.

22. He reveals his parentage and refers to himself in his "Chaturdandi Prakasika". Raja Chudamani Dikshitar, his disciple and author of "Tantrasikhamani" also refers to him.

23. Some opine that he is none else than the famous Tan Sen of Akbar's court, who is believed to be a Hindu converted to Islam. Venkatamakhi himself refers to him as his parama guru i.e., guru's guru.

and their derivatives. Moreover he has enunciated in 'Sloka form' the 'Lakshana' of the several Raganga, Upanga and Bhashanga Ragas of his time and has illustrated them with 'Geetas'[24], which are printed in the "Sangeetha-Sampradaya-Pradarsini." By these, Venkatamakhi has rendered remarkable and memorable service as his works form the very foundation of the modern science and practice of carnatic music.

Besides these, Venkatamakhi has written many other compositions both technical and melodic, which are not yet published. He is said to have composed beautiful 'Tanas' in different ragas and some archaic pieces like Ttayas ( ठाय ) which are quite indispensable to musicians especially "Vainīkas." Another work which is yet to be published is one 'Melakarta Ragamalika' in 6 ragas[25] in each of which the 'Sahitya' gives, in order, the names of the 12 ragas comprising a chakra altogether making 72. The value of the composition lies in that it facilitates an easy memorisation of the nomenclature of the melakartas besides appealing to the hearers with its beautiful and rare tunes.

It is known that Venkatamakhi has also composed many 'padas' in Kanarese, his mother-tongue, besides 24 'Ashtapadis' on Sri Thyagaraja of Tiruvarur which are attributed to him.[26]

### KSHETRAGNA

The greatest and foremost of the composers of 'padas' is Kshetragna whose compositions are met with in the most popular name "Kshetria-padas." An Andhra Trilingabrahmin by caste, he attained early proficiency in his mother tongue as well as music. His favourite deity was 'Lord Krishna at the shrine of Muvva, near Ghantasala in the Krishna Dt. By worshipping Lord Krishna

24. Each 'Melakarta' Geetam comprises of three 'Khandas' or parts. The first part gives the Arohana, Avarohana kramas with their respective 'vikriti' svaras represented by the special signs of Ra, Ri and Ru System, introduced in the body of the "Sahitya" which is invariably in praise of God. The language is 'Prakrit' throughout. In the 2nd part the author enumerates the Upānga ragas belonging to that particular Raganga (Melakarta). The 3rd part gives the list of Bhāshānga Ragas under that group, as having existed in his time.

25. Punnagavarali, Gowla, Kedaragowla, Sumadhyuti (Simhendra madyam), Gitapriya (Lathangi) and Nasamoni.

[Information got from Veena Vidvan S. Ananthakrishna Aiyar, belonging to the Sishya parampara of Dikshitar, of the South Indian Trinity.]

26. Not available in print.

devoutly he was blessed with the wonderful art of composing padas all of which are adorned with the mudra 'Muvvagopala.'

Kshetragna also came to the South on a pilgrimage to Rameswaram visiting many sacred places in which he has sung of the presiding deities.

He is said to have visited the court of Vijayaraghava Nayak, the last of the Telugu kings of Tanjore who ruled up to 1672 A.D. It is also said that he sang 5 padas in five ragas (Pancharatna) with the name Vijayaraghava Nayak and without the name 'Muvvagopala.'

In the "Andhrakaumudi," a work on Telugu grammar the author gives by way of reference, a chatu sloka composed by Kshetragna in praise Raghunatha Nayaka, the father of Vijayaraghava Nayak. Hence we may also conclude that Kshetragna was also a contemporary of Raghunatha Nayak (1614-1633 A.D.)

Kshetragna is said to have composed about 4500 padas in all. But only a thousand are known to enrich our music literature. He has employed in his compositions beautiful 'Pada-garbhas' and sweet melodies pregnant with 'Bhava' based on the theme of "Nāyaka-Nāyaki" relationship. "The dominating Rasa is, therefore 'Sringara'. This sentiment has given a convenient grip for much adverse criticism at the hands of those, unacquainted with the genius of Hindu religion, particularly its love aspect which is the peculium of all real devotees in every great religion. 'Love' is the natural outcome of the human soul, when it is freed from impurities and cured of distractions. Like the songs of Solomon and the chants of the Sufis these compositions will stand out in all ages as an expression of the enthusiastic rapturous love of the human soul (जीवात्मा) for the Divine God-head (परमात्मा). In this respect Kshetragna was a real 'Bhakta' like Saint Thyagaraja.

His compositions are found by scholars to be in strict adherence to the rules of Music composition. "They are also characterised by a slow and majestic movement, by which they carry the hearers into a region of pure rhythm and melody. The 'Ragabhava' is teeming in every song with the formation of appealing characteristic blendings. Hence the 'padas' are of great importance to South Indian Music. The selection of the Ragas, too is most suitable in giving full scope for expression of feelings. Most of the 'Ragas' are 'Rakti' ragas[27] for e.g. Kambhoji, Anandabhairavi, Useni, Nadanamakriya etc.

27. The 'lakshanas' of Rakthi Ragas are given thus in the 'Bharatha Sastra.' मध्यम पञ्चम भूयिष्ठो गानं हास्यशृङ्गारयोः

"The words of these padas, couched in fine Telugu, are often full of beautiful imagery most poetical and set to music equally plaintive and appealing to the senses. Therefore, they are best suited for " Abhinaya " with their irresistible charm of style and wistful cadences of their tender movements."—Many are the later composers of 'padas' who took as their model, Kshetragna's compositions.

There were, and there are a few expert musicians knowing many of the 'Kshetriya padas.' But it will be a great service to carnatic music, if all the available 'padas' are published in musical notation. True it is, that the music of the 'padas' cannot be adequately represented in notation. Yet they will at least be preserved in their outlines for the benefit of posterity.

## Giri Raja Kavi

A native of Tiruvarur (Tanjore Dt.) and an expert musician and scholar in Telugu and Sanskrit, Giri Raja Kavi was one of the State vidwans of Tanjore during the reign of Shahaji, the 2nd of the Mahratta rulers of Tanjore (1684-1711) who it is said, honoured him with liberal benefactions. He was a celebrated composer for his Vedantic songs and popular Telugu dramas called "Yakshagānas." It is said that Rama Brahmam, the blessed father of the great Thyagaraja, was the last of the five sons of Giri Raja Brahmam.[28] There are some manuscripts[29] of " Yakshaganas " in the Saraswati Mahal Library, Tanjore, which are ascribed to Giri Raja Kavi. The religious songs composed in lucid Telugu and believed to have inspired feelings of fervid piety, seems to have attained local celebrity. The 'Yakshaganas' are popular dramas with fine and simple song, their theme being wholly based on tales of folklore and puranic stories. Kshetragna is also found to have composed such types of compositions on his Royal patron. (One work Mss. No. 429 is ascribed to him in the Tanjore Library).

## Ghanam Seenayya

He was a Sri Vaishnava Brahmin, and his native place was Chettipatnam in the North Arcot District. He was a skilled musician and Telugu scholar. It is said that he was the honoured minister of the Nayak ruler of Madura, Vijayaranga Chockkanatha (or Raja) (1704-1731 A.D.). Probably, Seenayya was a contem-

28. (Family title was Brahmam).
29. Mss. Nos. 448-449, 450-581.

porary of Kshetragna. He left his native place and stayed at Mannaru Polur in the same Dt. and sang his kritis and padas on the deity 'Mannāruranga,' and hence the Mudra 'Mannaruranga, is employed by him. "Siva Diksha Paru" in 'Kuranji' Raga is a well-known pada of his.

### SADASIVABRAHMENDRA

"The songs of Sadasivabrahmendra are among the marvels of mature wisdom and melodious utterances" says a learned critic. Truly, such compositions which condense great philosophic truths in a nut-shell so as to be easily understood by all and sung to melodious music are very rare in our country and hence worthy of preservation.

Sadasivabrahmendra's life is found in detail in (i) "Atma Vidyavilasa" (Vanivilas Press), (ii) history form published in 1890 October at Brahadamba Press, Pudukkotah, (iii) "Sadasivamunivar charitam a Tamil poem written by Pandit Kanaka Raja Aiyer and another Tamil work "Ascharya Darpanam."

He must have acquired some knowledge of music during his boyhood and later on when his mind matured he composed the "Keertanas" which remind us now of his greatness. They are highly lyrical and breathe lofty ideas. The mudra employed is "Paramahamsa." They are very popular in South India. Most of them are said to have been composed at Sivagnanapuram in the Pudukkotah State, which he adorned in the time of Vijiya Raghunatha Thondaman (1730-1769). They occupy a prominent place in the literature of sacred music. The tunes have long been lost but are now replaced by others which are quite appropriate to the "Bhavas" conveyed by the compositions. The 'Sahitya' is however clothed in a highly musical, simple and lucid style.

### MARGA DARSI VIRABHADRAYYA

He was a wonderfully gifted Andhra musician, who lived during the reign of Pratapa Simha Maharajah of Tanjore (1741-1764 A.D.). He came from the north and was appointed as the chief Samasthana Vidwan and honoured with many gifts. He has left behind him a number of kritis, and Keertanas in many 'rakti' and 'desiya' ragas dedicated to Sri Pratapa Rama, the family deity of the Bhosale dynasty. Besides these he is the author of several Padas, Darus and Tillanas in praise of his Royal patron. His compositions are said to have been written in such a perfect style as to win for him the title "Marga Darsi."

### KAVI MATHRUBHUTAMAYYA

He was a Trilinga Brahmin musician and a Telugu scholar. Living at Trichinopoly (Trisira-Giri), he spent his days in pure devotion towards Sugandhi-Kuntalamba, the presiding deity of the place, by whose blessings he composed several 'padas' on "Sringara" theme. A musical drama "Parijatapaharanam" is said to have been composed by him. His compositions, now almost extinct[30] bore the mudra "Trisiragiri" and are said to be beautiful and pregnant with meaning.

An anecdote[31] which bears testimony to his sincere devotion tells of how he secured enormous wealth from Pratapa Simha Maharajah of Tanjore (1741-1764) who was directed to do so by the holy Mother, on behalf of Her true devotee.

### ARUNACHALA KAVIRAYAR

Among the composers of musical operas in Tamil, Arunachala Kavirāyar takes the foremost rank. Following the renowned Tamil poet, Kamba, Kavirāyar composed the famous "Ramanataka" in 250 keertanas and 250 verses, epitomising the whole epic without leaving the story, in an elegant and sweet style.

Born of a respectable Saiva-Vellala family at 'Tillayādi' (a village in the Tanjore Dt.) in the year 1712 A.D., he early exhibited a proficiency in Tamil and Sanskrit and by his 18th year he was a master of the five branches of Tamil Grammar. Losing his parents early, he got the help of the then pontif of the Dharmapura Mutt and became a renowned scholar.

Even from his boyhood he had a great attraction for the Ramayana of Kamba, which he read with great avidity and later on thought of popularising it.

He soon became famous as a lecturer and many disciples thronged under his roof at Shiyali where he settled after his marriage. Among his disciples there were two brahmin musicians Venkataramaiyer and Kothandaramaiyer. It was through their persuasion and enthusiasm that our Kavirāyar, who was already longing for popularising the Kamba Ramayana, began to evolve his "Ramanataka" in the form of a musical opera. The two musicians

30. Some rare compositions of this musician are found in possession of an old Sangeeta Vidwan, Harithirthamayya, of the Pudukottah State.

31. Told in detail in the Introduction to "Sangita Sampradaya Pradarsini".

readily set to music the 'Keertanas' and sang them in a wonderful manner. They received such a warm appreciation in the land that the author finished the work[32] soon and made a public declaration of the same before the "Sannidhi" of Sri Ranganatha at Sri Rangam, whose grace he invokes in the song " என்பள்ளிகொண்டரய்யா " in Mohana Raga. The then Patrons of Arts, like King Tulajaji of Tanjore, Pratapasingh, the zamindar of Udayarpalayam and Manali Muthukrishna Mudaliar, all joined in honouring the great composer. Kavirāyar seems to have died in 1778.

As mentioned above the "Ramanatakam" set the model for all future composers of operas. It is also characterised by an originality of rhyme, lucidity of diction and loftiness of meaning. The Ragas chosen are quite appropriate to the ideas and sentiments of the songs. They are purely Carnatic and come under the common 'melas'. Some 'Apoorva' ragas like Navaroz, Gowlipantu, Ghanta, Dvijavanti, Mangalakousika and Saindavi occur. The compositions mostly consist of 'Darus,' and Dvipadas for which Kavirāyar is noted. They also abound in several popular 'proverbs' inserted quite suitably and hence they have a moralising effect on the readers. Many later composers have chosen this work as their model and one of them is Anantha Bharati who wrote the Uttarakanda of the Ramayana in keertana form adopting the same model. He is also the author of the " Srimad Bhāgavata Dasamaskanda " kirtanas.

### RAMASWAMI DIKSHITAR

A musician of eminence and inventor of the Hamsadvani Raga was the father of Muthuswami Dikshitar of the Trinity of South Indian Music. He was born at " Virinchipuram " near ' Kanchipuram' (Conjeevaram), the native place of his ancestors, in the year 1735. In his 7th year many families migrated from Kanchi to the south and his parents [33] too left their native soil and settled at Govindapuram, a village near Tiruvidaimaruthur (Tanjore Dt.). Even as a boy he was gifted with a good voice and fair knowledge of music. As he lost his parents when quite young, his relatives resolved to engage him under famous musician who could teach him music on systematic lines. Accordingly he was put under the tutelage of Virabhadrayya of Tanjore for 2 years. Later on he had

32. The work seems to have been finished in 1772.
33. Venkateswara Dikshit and Bhagirathi.

the good opportunity to learn music under one Venkatavaidyanatha Dikshit (*alias* Muddu Venkatamakhi) a collateral descendant of the great Venkatamakhi, who taught him Veena and also the theory of music as expounded in the "Chaturdandi Prakasika". In a few years he became an expert musician and went to Tanjore where Tulajaji Maharaja. (1763-1787) duly honoured him in recognition of his musical talents. On his way to Tiruvārur, he met one Chidambaranathaswami who initiated him with "Sri Vidhya Upāsana" and ordered to worship, Goddess Kamalāmba at Tiruvarur. Hither went Ramaswami Dikshitar and settled after his marriage. He is said to have composed several kritis on Sri Thyagaraja and taught them to those who conducted the temple music service. Here was born his first son, the illustrious Mudduswami Dikshit in the year 1775, followed by two other sons and one daughter.

At the invitation of Manali Muddukrishna Mudaliar, Dikshitar went to Manali where he stayed there for several years. Chinnayya Mudaliar, the son of Muddukrishna Mudaliar honoured him with Kanakabhishekam in appreciation of his materpiece composition, the 108 Raga-tala malika beginning with the words: नाटकादि-विद्यल (Natakādi Vidyala).

A great devotee, he passed away at Tiruvarur on a 'Mahasivaratri' night in the year 1817.

Ramaswami Dikshitar has contributed to South Indian Music many 'Ragamalikas', 'Varnas' (both Chouka and Tāna) and keertanas, with the Mudra "Venkatakrishna." He brought into life the "Hamsadwani" Raga and illustrated it by writing a "Prabandha" besides several "Telugu Padas" in the same raga. He closely followed the traditions of music propounded by Venkatamakhi and hence the conformity of his compositions to "Sampradaya." He has also handled such "Apoorva" ragas like Vegavahini, Manohari and Poornachandrika. His "Ragamalikas" are models of a master Artist and could be handled only by experts. As he was a Vaineeka, his 'Chowka' and 'Tana' Varnas exhibit various shades and 'gamakas' peculiar to the instrument and therefore indispensable to the student of Veena.

34. Mr. T. L. Venkatarama Aiyar's articles in the "Kalaimagal" Magazine.

35. Mahamahopadhyaya Dr. U. V. Swaminatha Aiyar.

### PYDALA GURUMOORTHI SASTRI

Known as Veyi-gita (1000 gitās) Pydāla (house-name) Gurumoorthy Sastrulu, he was a Thrilinga Brahmin of the Murigi-nadu sect. He was a native of the place Kayaththur (கயத்தூர்) (Tinnevelly Dt.). He came and settled at Madras as an expert musician and received many honours from Manali Chinnayya Mudaliar. He is the author of many gitas (which are popular to-day), Prabandhas, and keertanas and has signed them with his own name. He seems to have lived about 1740 A.D. and hence may be a later contemporary of Ramaswami Dikshitar.

### PACHIMIRIAM ADIPPYYA.

The composer of the most popular and beautiful varna (tana) विरिबोणि (Viriboni) in Bhairavi raga, Ata tala, was a Madhwa Brahmin. He was a master of the theory and practice of music and an expert Vaineeka[36] and he held, therefore, a prominent place among the state vidwans during the resigns of Pratapasimha Maharaja (1741-1764 A.D.) and Tulajaji Maharaja (1765-1787), rulers of Tanjore. He was such a noted authority in music that famous musicians like Ghanam Krishnaiyyar, Syama Sastri, Pallavi Gopalayyar and others sat at his feet as disciples. He was also patronised in the Pudukkottah State and in the zamindari of Udayarpalayam. His son was Veena Krishnayya who wrote three compositions of the type called 'Saptatales-waram'[37] and who along with his son Veena Subbukutti Ayya adorned the court of Raja Raghunatha Thondaman.[38] Adippayya has composed many Gitas in rakti and desi ragas and many Keertanas in Tamil and Kanarese with 'Gamaka' combinations and employed the Mudra श्रीवेङ्कटरमण. The popular Svarajati in Huseni Raga, Roopaka Tala, beginning with एमन्दुयानरो[39] was set to tune by Adiappayya while the 'Sahitya' was supplied by Merattur Venkatarama Sastrulu. Adippayya is also credited with having systematised the methods of singing Ragas (Alapanas) and 'Madhyama kala Pallavis."

36. The late Veena Seshanna of Mysore was said to be related to the family of Adipayya.

37. A type of composition which could be so dexterously handled so as to adapt itself to 7 talas when sung at the same time.

38. 1825-1839.

89. The new reading is एमायलाडिरो

### PALLAVI GOPALAYYAR

He was a pupil of Pachimiriam Adippayya and older than Syama Sastri. He was a Smartha Brahmin of the Vadama sect, and a native of Tanjore. An expert in Pallavi-singing, he was a state vidwan during the reigns of Amarasimha Maharaja[40] and Sarafoji Maharaja.[41] Besides being a good vocalist, he was an expert in veena-playing and was well versed in Sanskrit and Telugu.

He is the author of many compositions in both languages bearing the signature 'Venkata.' But only a few of them are available to us. The following keertanas are well-known: नीदुचरण पङ्कजमुले (Needu charana pankaja mule) in Kalyani, अम्बनादु (Amba nādu) in Todi, नीदुमूर्तिनि (Needu moorthini) in Natakuranji. The two classical Ata tala varnas: कनकाङ्गि[42] (Kanakāngi) in Todi and वनजाक्षि (Vanajakshi) in Kalyani which are composed by him are splendid compositions. They are very valuable to students of music, for they serve to develop vocal powers as well as the finger-technique very well.

His compositions are noted for their scholarliness, in style as well as technique. They all follow one new style and bear the striking individuality and orginality of their creator. The 'Chitta' svaras appended to the keertanas are superb and form indispensable ornaments to them. In fact, his compositions are admired to-day, by scholars and musicians and rank among the best ones that we have in South Indian Music.

### TRINITY OF SOUTH INDIAN MUSIC

A remarkable period in the history of South Indian Music, the very golden age, is the period comprising the latter half of the 18th and the former half of the 19th centuries, for the famous Musical Trinity of South India Thyāgarāja, Mudduswami Dikshitar and Syāma Sastri lived and flourished during this period—Accounts of these great men's lives and services to music have been penned in a detailed manner by eminent scholars and critics of music both in English and Tamil. Further, they are broadcasted from time to time during the festive annual celebrations held in honour of

40. 1788-1799.
41. 1800-1832.
42. This varna is dedicated to Sarafoji Maharajah who is referred to in the Anupallavi.

the great Musician—composers. Hence it is proposed to leave them in this study.

They are really the epoch-makers in the realm of Carnatic music inasmuch as they not only influenced the music of their times, but served as beacon-lights for the host of composers and musicians that followed them and left to the world their rich legacy of compositions bearing their inefacable stamp.

Their services to Carnatic music in brief, lay in the following directions. They departed from the styles of their predecessors and equipped with singular ability and rare originality, they explored the untrodden region of ragas and gave to the world many 'obscure' ragas condensed in their fresh beauty through their kritis and thus saved them from oblivion. They revealed and practically enjoyed themselves the true music (*nija* sangita) and propagated its intrinsic beauties to all, from the scholar of music to the humblest man in the street. They were the chosen Apostles of Music in bringing to play the precious possibilities of the art which lay concealed to the former musicians and delivering their message to inspire and enlighten the future generations to progress in the new field of triumph and achievements in Music. They have established distinctive styles in their kritis and have developed that musical form to such a degree of perfection that it seems rather difficult to improve upon them.

An account of the brothers of Mudduswami Dikshitar, Chinnaswami and Baluswami, is given in the "Sangeeta Sampradaya Pradarsini" of Subbarama Dikshitar whose life is also included in the book. Information about Subbaraya Sastri and Annaswami Sastri, the son and the grandson of 'Syama Sastri' is found in the book "Syama Sastri and other famous figures of South Indian Music."—by Prof. P. Sambamurthi Avl.

### MERATTUR VENKATARAMA SASTRI

A noted contemporary of Saint Thyagayya and a profound scholar in music and Bharata Natya, Sastri was a Telugu Brahmin of the Velanadu sect who hailed from the village of Merattur[43] in the Tanjore Dt. (near Ayyampet R.S.) His contributions to Carnatic music are in the shape of 'Yaksha ganas' Musical Operas in Telugu. Venkatarama Sastri was born at Merattur in the year 1807 and attaining high proficiency in music, Sanskrit and Telugu

43. His ancestors migrated from Guntur and settled here.

began to compose in his 25th year. He is said to have been a sweet vocalist and a talented Artist on the Saranga.

He is said to have composed about 12 "Operas" out of which only 11 are found and exist in Manuscripts.[44] Besides these he is also the author of several 'padas.' His 'operas,' which were used to be performed by his disciples wherein he played the role of the heroine, were said to be so fine as to attract eminent musicians and noble men of his time.

The works of Sastri possess some distinctive features. They are not only fine specimens of Telugu Literature but satisfy the essential features of Sangita, namely Gita, Vadya and Nritya. He has thus brought to bear a profound knowledge of musical art on his dramas. "His 'Darus'" says a critic, "are worthy of being placed besides the compositions of Thyagayya himself, and in them is found a persisting reminiscence of the sweep and majesty that characterises the masterpieces of Pallavi Gopalayya. He reveals his versatility in melody types through a number of compositions in ragas like Ahiri, Devagandhari, Todi, Ghanta, Pantuvarali etc." Many 'Darus' are adorned by beautiful chittasvaras and 'Solkattu' svaras and this points out his talents in the art of dance. The 'Ragas' suit wonderfully the 'Bhavas' portrayed by 'Abhinaya'. He was also a master artist in handling the couplets of verses called 'Dvipadas.' The prelude or argumentary portion of each work is in this verse.

His plays have nearly 70 years been put upon the stage during Nrisimha Jayanti festivals in several noted villages of Tanjore Dt. and have been attended by eminent musicians of recent times.

### SVATI TIRUNAL MAHARAJA

His Highness, the Royal poet and Composer of Travancore forms the central figure among the musicians and composers of that beautiful state. His compositions have become popular not only in Travancore but also in other parts of South India. He ruled from 1829-1847. He was born on the 6th April 1813.

44. Mss. found in the possession of the "Sishya parampara" in the villages of Merattur, Uththukadu and Annikudi. (i) Prahlada Charitram; (ii) Markandeya . . . ; (iii) Rukmangada . . . ; (iv) Usha Parinayam; (v) Harischandra Natakam (2 parts); (vi) Rukmani Kalyanam; (vii) Sivarathri Natakam; (viii) Satsanga Raja Natakam; (ix) Asatsanga Raja Natakam; (x) Seeta Kalyanam; and (xi) Jagan Maha Leela Natakam.

When he ascended the throne in his 16th year, he seems to have attained proficiency in all languages and inspite of his royal duties he applied himself strenuously to the improvement of his original knowledge of fine arts. Even as a boy he exhibited talents in music and 'Sahitya' which he developed in a short time to a marvellous extent. He also invited celebrated scholars, poets and musicians from various parts of India and maintained them under his patronage. Kanniah Bhagavatar, a disciple of his elder and illustrious contemporary Thyagayya, and the famous Nattuva brothers of Tanjore, Ponnaiah, Chinnaiah,, Vadivelu and Sivanandam, disciples of Dikshitar, were all his court musicians. There were many local celebrities like Govinda Marar,[45] Iravi Varman Thampi, Parameswara Bhagavathar, a devoted companion of His Highness and Ksheerabdi Sastri. It was inevitable that under the influence of such a musical atmosphere, the Maharajah should become a notable musician and composer.

He was a prolific composer and his works[46] comprise many types of compositions e.g., Keertanas, Varnas, Padams, Thillanas, Prabandhas, as well as, Dhrupads, Tappas and Khyals (from Mahratti and Hindusthani music).

His Keertanas are mainly devoted to the praise of his own Dynastic deity "Sri Padmanabha" and as such they contain the Mudra "Padmanabha" or its synonym. The language is invariably Sanskrit and some times, 'manipravālam.'

The Varnas reveal the talents of a master musician. They abound in technical beauties like 'Svaraksharams' and the skilful introduction of the name of the Raga into the 'Sahitya.' Many of them are popular to-day. The padas are addressed to 'Sri Padmanabha' who is treated as the 'Nayaka', and are in Sanskrit, Telugu and Malayalam.

His Highness was not a mere composer. He was a master of the science of music and a study of His Varnas and Madhyamakala

45. An account of Govinda Marar, the celebrated musician and composer who was honoured by Thyagayya, is given in the book "Thyagaraja" of M. S. Ramaswami Aiyar (pp. 101-108).

46. The available works are given below:—(i) Sri Padmanabha Sataka; (ii) Syanendura-pura-varnana Prabandha; (iii) Ajamelopakhyanam; (iv) Kuchelopakhyanam; (v) Sangita Kritis; (vi) Utsava-varnana Prabandha; and (vii) Bhakthi Manjari. For a detailed account of the works refer to "Sangita Kritis" edited by K. Sambasiva Sastri, B.A., and "Svāti Thirunal's Compositions in Malayalam" by K. Chidambara Vadyar, B.A.

kritis will bear testimony to this fact. The peculiar charm of his compositions lies in that he has not only clothed his thoughts in the aptest words, but has chosen the most suitable modes or ragas. He has dealt with all the important ragas in the Carnatic music besides using many others peculiar to the Mahratti and Hindusthani Music.

Like Thyagayya's, Svathi Thirunal's compositions are both simple and complex. The simple ones are so finely simple so as to be adapted for beginners of music. His larger pieces such as his varnas and Ghanaraga kritis are, on the contrary, highly complex and could be handled only by advanced musicians. In the words of a learned Critic " His style combines the excellency of Aryan and Dravidian music while avoiding the defects of both." In fact, the Royal Composer combines in his style, the elegancy of Thyagayya's with the grandeur of Dikshitar's.

His compositions possess one distinctive peculiarity which consists of the composer's copious insertions in them of choice " Svarāksharams." He had adroitly used them in several of the compositions without vitiating their meaning a little. Original, as he is, in this technical beauty, he has few rivals in this art. Himself a poet and musician of high order, he threw his heart and soul into music and left a rich legacy of more than 400 songs, many of which are still sung in and out of Travancore.

### PARAMESWARA BHAGAVATHAR

He was one of the illustrious contemporaries of Svati Thirunal Maharajah, being only two years younger than his Royal patron. A brahmin of Palghat by birth, he was born in the year 1815, A.D. at 'Noorani' village. But, as he lost his parents when quite young, he was brought up by his uncle at Guruvayoor. As a young boy of seven he sang wonderfully before the holy presence of Lord Sri Krishna at Guruvayoor, by whose grace he later on became a gifted musician. He also came into contact with many vidwans who visited the holy temple and by the time he was 16, he acquired a sound knowledge in the theory and practice of music as well as ability to compose songs in Sanskrit and Malayalam.

During his 18th year, he went to Trivandrum. Attracted by his accomplishments, the young prince Svati Tirunal found him a worthy companion and made him the chief court musician. Availing of the facilities of the State he soon developed his art (especially in singing Tanam he was said to be unrivalled) as a vocalist and also attained skill on the Violin, Svarabath and Veena.

Both Svathi Thirunal and our Bhagavatar spent many a precious hour in the joint production of beautiful Varnas and Kritis the one composing the 'Sahitya' suitable to the other's melodies, each vieing with the other in the exhibition of his talents.

Parameswara Bhagavatar, has composed many songs, purely devotional, while he was on his pilgrimage in which he visited many sacred places, both in and out of Travancore. In addition to this, he is said to be the author of several scholarly varnas in the ragas Todi, Nāta, Sankarābharana, Behāg, Gowla, Varāli, Sri Rāgam, Ārabhi, Khamās, Yadukula Kāmbhoji and Bilahari. He had occasion to meet the great Thyagayya on his tour in the Tanjore District and many other reputed musicians like Peria Vaithi of Sivaganga, who, admiring his compositions learnt them from him. He is said to have settled in his village, after the tour, where taking "Sanyasa Asrama" he attained 'siddhi' in the year 1892 (his 77th year).

One of his disciples was the celebrated Coimbatore Raghavier, the famous rival of Maha Vaidyanatha Iyer. Mahadeva Iyer, his son, was an expert violinist, composer and linguist. Among his contributions to musical literature the following are important: Geetams in Telugu, a set of ten Geetams on the science of music (Sangita Lakshanam), Javalis, Kritis, Nirupanams, Svarajatis and Varnas (in the ragas, Darbar, Behag, Poorvakalyani, Jenjoti, Vasanta, Hindusthani Kapi and Huseni). The late Anantharama Bhagavatar was one of his disciples. His compositions together with those of his renowned father, have been preserved in their native village and measures are now being taken to scrutinise them and publish them with musical notation.

It is only 20 years since Mahadeva Iyer died and accounts given above were kindly supplied by his sister who is now living at Chalai Agraharam, Trivandrum.

## Eravi Varman Thampi

He was one of the many gems, among the sons of the soil, that adorned the Court of Svati Thirunal. Belonging to the Royal family he was born at Trivandrum in the year 1783 (958 Q.E.). As he was a consummate Sanskrit scholar, an able composer and author in music, he has contributed many Operas, padams and kritis in Sanskrit and Malayalam and they were considered to be hardly inferior in their finish and beauty to those of Svati Thirunal.

The themes of his "Operas" which are more popular than his songs, are drawn from the Puranas viz., 'Keechaka-vadam' 'Dak-

shayagam', 'Uttarasvayamvaram' and the like. These were greatly admired and encouraged by the rulers of Travancore. In all he is the author of 54 musical dramas, based on various folk-lores of the country, which were collected with great endeavour by the composer and thrown into shape. His compositions uniformly possess, "Arthalankara", "Sabdharthapushti" and "padalālithyam", and hence by themselves best suited for music. His devotional kiritis are pregnant with meaning and emotion.

### KSHIRABDI SASTRI (1847-1860)

A native of Tinnevelly, he lived about 90 years ago in the reigns of Svati, Uttaram and Ayilyam Thirunal (Maharajahs of Travancore). A brahmin by birth, he renounced family life and devoted himself to a practical philosopher's life. He was a great linguist and the author of many devotional songs in a popularly appreciated style. His Guru was one Sivarama Yogi, to whom all his compositions were dedicated (the mudra employed is "Sivarama").

A Devi-Bhaktha and a skilled musician, he was honoured by the then rulers of Travancore. Music to him, was a vehicle of his philosophic and noble ideas to be carried to the people at large and so his songs condense philosophic truths. But only a few of them are popular in Trivandrum. He lived up to his 70th year. His songs are sweet and simple in their style and are sung to popular tunes.

### THE PONNAYYA BROTHERS OF TANJORE

The four brothers originally belonging to Tanjore, namely, Ponnayya, Chinnayya, Sivānandam and Vadivel, adorned the court of Svati Thirunal as experts in Varna composition, Dance, Drum and Violin respectively. Of these Ponnaiyya was the eldest and a gifted composer. Vadivelu, the youngest, was the most distinguished.

The ancestors of these famous brothers were by profession Oduvars (Reciters of Devaram) in temples and also experts in the art of Bharata Natya, their native place being a village Senganar Koil (near Mannargudi) in the Tanjore District.

They were the original writers of compositions like Padams, Tillanas, Chouka Varnas and Javalis, etc., intended for their professional art. In the time of Tulajaji (1765-1787) Maharaja of Tanjore, one Subbaroya Nattuvanar belonging to this family got royal patronage and left his native place for Tanjore which became a permanent place for the family. He also got an appointment as the Chief Instructor in a school which was then started for giving

training in the fine arts, especially the art of dance, and his four sons, the four famous brothers were put to training in that school.

Ponnayya and Vadivel distinguished themselves when young, in composing songs and when they also learnt Sanskrit, Telugu and Music, they composed beautiful Kritis, Varnas and Svarajatis. Vadivel also took a special aptitude for the then newly introduced Violin in which he soon attained wonderful skill, by dint of his intelligence and strenuous application.

The Maharajah of Tanjore took a special interest in them and arranged for their musical training under the great Mudduswami Dikshitar at Tanjore. Ponnayya received the full benefit of the training and became an expert composer. In the Kriti in 'Binna Shadja' Raga and Tisra Eka Tala, beginning with श्रीगुरुगुहमूर्ति किने शिष्युडै युन्नानु,' he pays his homage to his Guru. He is the author of several Varnas (Tana and Chouka), Svarajatis, Padas, Thillanas and Kritis. His Kambhoji Varna "Sarasijanabha" is very popular in South India to-day.

Vadivelu and Svati Thirunal have conjointly composed many varnas of which the one in Kapi " सुमसायक ' is a fine specimen. Anyhow Vadivelu is known more as a violinist than a vocalist. He is credited with having introduced for the first time, the violin in S. I.

### GHANAM KRISHNA AYYAR

One of the notable contemporaries of Thyagaraja, he was a famous singer of madhyamakala and the greatest composer of Tamil padas. As he came to possess an unrivalled skill in the "Ghana" method of singing he was honoured with the title 'Ghanam' which he earned by unflinching practice and perseverence. The music world of to-day must be very grateful to Mahamahopadhyaya Dr. U. V. Swaminatha Iyer,[46a] for his recent valuable publication of Ghanam Krishna Aiyer's life and compositions, containing many interesting anecdotes.

Possessing a fair knowledge of music by heredity Krishna Aiyar sought tutelege under Pachimiriam Adipayya, the chief state vidwan of Tanjore, and soon rose to the rank of State musician. It was here that he came into contact with the celebrated

46a. His father was one of Ghanam Krishna Aiyar's disciples.

Andhra musician, Bobbili Kesavayya from whom he learnt the 'lakshanas' and 'lakshyas' of the "Ghana" Marga in which he soon acquired wonderful mastery in recognition of which he was honoured with the title "Ghanam".

As a composer of Tamil padas he was equally esteemed by such eminent patrons and critics of art as Sarafoji, Amarasimha and Kachi-Rangappa Udayar. Many of his songs were composed at the request of his friends and patrons. At other times he would sing of his local deity Sri Soundararaja. He also toured many places and sang of the presiding deities. Most of his 'padas' are in praise of his "Ishta Devata," "Subramanya," among which 'Velavare' in Bhairavi is a popular one. His compositions are all replete with ragabhava and the theme is invariably "Sringara." Inspite of the grammatical errors in the "Sahitya" they are unique for their musical excellence. It is but quite essential that measures should be taken for the popularisation of his compositions, especially when there is a growing demand for the revival of Tamil compositions which are to be given more prominence in concerts.

### Anai-Ayya (Brothers), (1798-1824)

They were twin brothers (Anai and Ayya) who hailed from the village called "Vaiyaicheri" (near Ayyampet R. S. Tanjore District). Belonging to a family noted for its scholarliness, they too became well versed in Sanskrit, Telugu and Tamil. They were Composers of keertanas in these languages and were adepts in Pallavi singing. They were patronised by Sarafoji, the then Rajah of Tanjore. Only a few of their keertanas are popular now. They chiefly relate to the presiding Deities of Tiruvayar (Pranatharthi Hara and Dharma Samvardani). The mudra employed is (उमादास). They are both simple and possess fine ragabhava.

### Pallavi Doraiswamy Iyer

A younger contemporary of Anai-Ayya brothers, he enjoyed with them the royal patronage of Sarafoji. He was an expert in Svara and pallavi singing. He did not directly undergo training under Thyagayya but greatly benefited by learning his compositions from others. A native of Tiruvayar he was popularly known as 'Padinaindu mandapam' Doraiswamy Iyer. He seems to have met the Andhra Musician Bobbili Kesavayya and defeated him in Pallavi singing. He is also the author of many Original Kritis bearing the Mudra "Subramanya" in Telugu and Tamil, many of them not yet made popular.

(*To be continued.*)

## UNIVERSITY NOTES

On the inauguration of provincial autonomy, 1st April 1937, the University became a central subject. Certain consequential alterations in the University Act were made by an Order in Council.

On the expiry of the term of Mr. R. Littlehailes on 20th May 1937, Diwan Bahadur S. E. Ranganadhan was appointed Vice-Chancellor.

The main Convocation was held on 30th July 1937 at the Banqueting Hall, Government House, when H. E. the Chancellor presided. The address to the new graduates was delivered by Rao Bahadur Dr. A. Lakshmanaswami Mudaliar, a member of the Syndicate, then Ag. Principal, Madras Medical College. Supplemental Convocations were held on the 31st July 1937 and 18th February 1938, at which the Vice-Chancellor presided.

The Madras Christian College, which was originally situated in George Town, Madras, ceased to be a constituent College on its removal to its new buildings at Tambaram, where it now functions as a Residential and Affiliated Honours College.

The University is considering the steps to be taken on the recommendations of the Report of the Sapru Committee on Unemployment so far as they are applicable to conditions in this University area. It is proposed to establish an Employment Bureau which would give information about the possible careers open to, and the kind of training required by, graduates and undergraduates in the various avenues of employment. One of the functions of the Bureau will be to get into touch with employers of labour. Attention is being given both to the revising of existing courses of studies and the instituting of new ones in accordance with the recommendations of the Committee.

On the request of the Premier of the Madras Government, the University, through its Department of Economics, has undertaken an economic survey of five villages and one town in the Salem district with a view to estimating the effects of prohibition in that district. A special expenditure of Rs. 1,200 has been sanctioned for the purpose. The Professor of Economics is in charge of the

survey. The first preliminary survey has been completed. The second and the final surveys will be conducted sometime in April and September respectively.

A scheme of research on the Morphology and Anatomy of the Sugarcane Sorghum hybrids, submitted in 1933 by the University at the instance of Dr. T. Ekambaram, Professor of Botany, Presidency College, Madras, was sanctioned by the Imperial Council of Agricultural Research in 1937. Research on the scheme is being carried out at the Presidency College, Madras, and at the Agricultural Research Institute, Coimbatore, under the supervision of Dr. T. Ekambaram. Mr. K. R. Ramanathan, M.Sc., has been appointed Research Assistant in connection with the work.

The Department of Politics and Public Administration was opened during the year and Mr. E. Asirvatham, B.A., B.D., Ph.D., has been appointed Reader. A Diploma course in Politics and Public Administration has been instituted.

The Diploma course in Indian Music has been made a two year course. The staff has been strengthened. Mr. P. Sambamurthi has been appointed Lecturer and Vidvan K. Ponniah Pillai Vocal Assistant. Messrs. Parur Sundaram Ayyar and Udaya Varma Raja continued as Violin and Veena Assistants.

A Diploma course in Librarianship has been decided to be introduced. It will be a one year course.

Besides the lectures by Heads of Departments, lectures under the various Endowments, Honorary Readership lectures and Extension lectures, the following persons were invited to deliver special lectures :—

Prof. Hadi Hassan, M.A., Ph.D., of Aligarh University, delivered a lecture on Mutamid : the Poet Prince of Andalusia.

Dr. Andrew Krzesinski, Professor of Philosophy, University of Cracow, Poland, delivered a lecture on 'Will the Modern Culture Fall'.

Dr. Poul Tuxen, Professor of Sanskrit, University of Copenhagen, delivered a lecture on 'In what sense can we call the teachings of Nagarjuna Negativism ?'.

The Rev. H. Heras, S.J., of St. Xavier's College, Bombay, delivered two lectures on the Mohenjo Daro Inscriptions.

Prof. F. E. Fritsch, F.R.S., of London and Lt.-Col. R.B. Seymour-Sewell, F.R.S., of Cambridge, delivered a course of lectures on Algae and Oceanography of the Indian Ocean respectively.

A course of vacation lectures on School Library Work was arranged this year also for the benefit of teachers in High Schools. The lectures commenced on the 21st December 1937 and ended on the 1st January 1938. The course was conducted by the Librarian and the Assistant Librarian of the University Library.

The Editorial Board of the Catalogus Catalogorum issued a sample fasciculus of the new Catalogus Catalogorum. Copies have been distributed to scholars who attended the 9th All-India Oriental Conference held at Trivandrum and to other scholars inviting their suggestions. The fasciculus is about 8 formes in double demi size and the portion covered is from 'A' to 'Aug.' This portion has taken into account 252 volumes of new catalogues not used by Dr. Aufrecht in his C. C. and contains 757 articles as against 303 articles which Aufrecht's 3 vols. contain for the corresponding part.

The following works by the members of the Research Departments were published during 1937 : —

*Indian History Department.*

1. Colas, Volume II—Parts I and II—Mr. K. A. Nilakanta Sastri, Professor of Indian History and Archaeology.

*Indian Philosophy Department.*

2. Siddhantalesasangraha of Appayya Dikshita, Volume II—Mr. S. S. Suryanarayana Sastri, Reader in Indian Philosophy.

*Tamil Department.*

3. Sri Sivagra Yogin's Sivaneriprakasam—Mr. S. Anavaratavinayagam Pillai, Reader in Tamil.

*Sanskrit Department.*

4. Brhati, Part II—By Mr. S. K. Ramanatha Sastri, Junior Lecturer in Sanskrit.
5. Saraswatikantabarana of Bhojadeva—By Dr. T. R. Chintamani, Senior Lecturer in Sanskrit.
6. Nanarthasangraha of Ajyapala—By Dr. T. R. Chintamani, Senior Lecturer in Sanskrit.

7. Nayaviveka of Bhavanatha Misra—By Mr. S. K. Ramanatha Sastri, Junior Lecturer in Sanskrit.

*Telugu Department.*

8. Navanadhacharitra—By Gaurana—By Mr. K. Ramakrishnayya, Senior Lecturer in Telugu.

9. A Critique on Nannichodadeva's Kumarasambhava—By Mr. S. Lakshmipathi Sastri, Junior Lecturer in Telugu. (Issued as a Bulletin.)

*Malayalam Department.*

10. Kavyajivitavrtti, Volumes I and II—Mr. P. Krishnan Nayar, Junior Lecturer in Malayalam.

*Arabic, Persian and Urdu Department.*

11. Waqiat-i-Azfari—Md. Hussain Mahvi Siddiqui, Junior Lecturer in Persian (Issued as a Bulletin).

*Other publications.*

Studies in Tamil Literature and History by Mr. V. R. Ramachandra Dikshitar, Lecturer in Indian History.

Reprints, for purposes of sale, were taken of the following articles which were published in the University Journal:—

History of the Poets of Southern India and the Deccan.—By Moulvi Muhammad Munawar Gowhar Sahib Bahadur.

Grammatical Essays—By Mr. V. Venkatarajulu Reddiyar. (Issued as a Bulletin of the Tamil Department).

A critique on Nicolai Hartman's Ethics—P. V. S. Narayana.

*Other reprints (Endowment Lectures).*

Humanism and Indian Thought—Principal Miller Lectures, 1935—By Mr. A. Chakravarti.

Ophthalmology in its relation to clinical Medicine—Maharaja of Travancore Curzon Lectures, 1936-37—By Rao Bahadur Dr. K. Koman Nayar.

Indian Political Theories—Rt. Hon'ble V. S. Srinivasa Sastri Lectures, 1936-37—By Sir C. P. Ramaswami Ayyar.

# REVIEWS

## MAHA YOGA OR THE UPANISHADIC LORE IN THE LIGHT OF THE TEACHING OF MAHARSHI RAMANA. By " Who ", published by the New Light Publishing House, Pudukotah. Pages 119. Price Re. 1.

In this interesting book the author presents the teachings of Maharshi Ramana dressed in a metaphysical garb. He maintains that the philosophy of the sage is predominantly Advaitic, but without the narrowness that is often a feature of book-taught adherents of that school (p. 117). That the extinction of egoity through inquiry into the nature of the self leads to deliverance and consequent realisation of supreme happiness is the essence of Maharshi's teaching.

There are several versions of Sri Ramana's philosophy; and there have already arisen disputes among the different exponents of the saint's message. But the fact that the real language of the soul is silence and that people flock to Ramanasram not so much for hearing the saint speak as for getting enraptured by his dumb eloquence is very often forgotten. Any individual who has had the opportunity of seeing the sage would admit that silence is his highest teaching. The author of the book under review rightly observes, " His teaching is mostly by silence; visitors come to him ready to question him minutely; but once they are before him the questions melt away; they just feel the blessedness of his presence and do not want to disturb it."

The present work is written in a clear and understandable style. It is hoped that aspiring souls will be benefited thereby.

S. S. S.

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## THE NĀṬAKALAKṢAṆAKOŚA of Sāgaranandin edited by Myles Dillon, Vol. I. Text. Published by the Oxford University Press, 1937. Price Sh. 15/-.

The credit of the discovery of the Nāṭakalakṣaṇa Ratnakośa goes to the late lamented indologist, Professor Sylvain Levi, to whom the book has been most appropriately dedicated. It has now been edited and published for the first time by Prof. Myles Dillon of the University College, Dublin. In preparing this edition for the press Professor Dillon has bestowed much care and thought and has

presented us with a text free from errors and irregularities of the scribe. Passages which did not yield emendations have been left as they stood in the manuscript and have been marked by an asterisk in the margin. The editor promises to publish a translation of the text, an introduction and notes.

In the preface to the text, a brief reference is made to the authorship and date of the Ratnakośa. That it is a medieval work no one can gainsay. Its scope is limited to the technique of the stage. There is no elaborate discussion on the different forms of music and rhetoric which one meets in the Nāṭyaśāstra. Its special value consists in the fact that it illustrates certain important chapters of the Nāṭyaśāstra. Very little is known of the author Sāgaranandin. Though it is not possible to give a precise date of its composition, Professor Dillon is inclined to place it in early thirteenth century. But it is a fact of the utmost importance to note that it makes no reference to the Daśarūpa of the tenth century. The popularity of the work is attested to by the many references to it by the author of the Sāhityadarpaṇa, by Rāyamukuṭa, a commentator on the Amarakośa, by Rucipati in his commentary on Anargharāghava, and by Ranganātha in his commentary on Vikramorvaśīya. Before we close, attention may be drawn to the mention of Rāghavābhyudaya, a work whose authorship was hitherto unknown and is now ascribed to Viśākhadatta. We congratulate the Professor for giving us a good edition of the Ratnakośa.

V. R. R.

## BOOKS RECEIVED

From J. M. Dent & Sons, Ltd.:—

*A Text-book of Modern European History,* 1453-1661. By George W. Southgate.

*A Text-Book of Modern European History,* 1643-1848. By George W. Southgate.

*Rome—Republic and Empire, Vol. II—The Empire.* By H. W. Household. 3s. 6d.

*Organic Chemistry—A Supplementary Text-Book and Revision Course.* By A. J. Mee. 4s. 6d.

*Electricity and Magnetism.* By R. G. Mitton. 3s. 6d.

*Examples in Practical Mathematics for five-year students.* By T. H. Fallows. 1s. 3d.

From Macmillan & Co.:—

*Introductory General Science.* By L. M. Parsons. 3s. 6d.

*A Short History of Chemistry.* By J. R. Partington. 7s. 6d.

Oxford University Press:—

*Physics: An Introductory Text-Book.* By H. J. Taylor. Rs. 5.

*A History of Britain.* By E. H. Carter and R. A. F. Mears. 10s. 6d.

*The Natakalakshnakosa Vol. I.* Edited by Myles Dillon 15s.

Cambridge University Press:—

*Exercises in French Prose and Free Composition.* By C. W. Wordsworth. 3s. 9d.

*Byron—Satirical and Critical Poems.* Ed. by Joan Bennett. 3s. 6d.

A. & C. Black:—

*British History*—1688 *to* 1936. By M. W. Keatinge and D. G. Perry. 6s.

Central Book Agency, Calcutta:—

*Elements of Civics—Part I.* By Prof. B. K. Bhattacharya. Re. 1-8.

The New Light Publishing House, Pudukotah:—

*Maha Yoga or the Upanishadic Lore in the Light of the Teaching of Maharshi Ramana.* By "Who." Re. 1.

# PUBLICATIONS OF THE MADRAS UNIVERSITY

*(Text-books, Calendars and Question Papers have been omitted.)*

| Name of Publications | | Price Rs. A. P. |
|---|---|---|
| *1. | **Some South Indian Villages,** by Dr. G. Slater. Available at the Oxford University Press, Madras ... ... each | 5 0 0 |
| 2. | **Sources of Vizianagar History,** by Dr. S. Krishnaswami Aiyangar, available from the Superintendent, Govt. Press, Mount Road, Madras ... ... ... each | 4 8 0 |
| 3. | **Dravidic Studies,** (available from the Superintendent, Govt. Press, Mount Road, Madras). | |
| | Volume I ... ... ... | 0 2 0 |
| | Volume II ... ... ... | 0 8 0 |
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